



2025

80th Annual Meeting

North Central Weed Science Society

www.ncwss.org

December 15-18, 2025

**Amway Grand Plaza
187 Monroe NW
Grand Rapids, MI 49503**

NCWSS Program

President's Welcome

2025 North Central Weed Science Society Meeting

Welcome to the 80th Annual Meeting of the North Central Weed Science Society (NCWSS) and to the iconic Amway Grand Plaza hotel in beautiful Grand Rapids, Michigan.

President-Elect Brett Miller and the Program Committee have organized a terrific meeting that we hope will stimulate many great discussions and help everyone leave with a few new ideas on how they might improve weed management in their sphere of influence. We were thrilled with an increased number of oral, poster, and video submissions from last year! We are also very grateful to those who helped organize symposia, which include: year 2 of "What's New in Extension," "The Drone Revolution in Weed Science," "The Impact and Future of Biologicals," "What's New in Industry," and "Career Development and Interview Strategies" focused on Graduate Student Development.

We are pleased to welcome special guests Dr. Tim Boring, Director of the Michigan Department of Agriculture and agronomist, and Dr. Mirelle Luecke, Supervisory Curator of the Gerald Ford Presidential Museum and Library who will both share insights on Michigan during the General Session Tuesday morning. We also welcome Dr. Corey Guza, who will give the keynote address during the Industry Breakfast Thursday morning.

We appreciate the diligent efforts and attention to detail of the Local Arrangements Committee, chaired by Christy Sprague and Erin Burns. We also appreciate the efforts of Eric Gustafson, NCWSS Executive Secretary, and Don Gossard, in helping with registration, website management, and numerous other details that enable a successful meeting.

The Annual Meeting is greatly enhanced by our Sustaining Members. We especially acknowledge the support of BASF hosting the Student Mixer Monday evening, Bayer supporting the Women in Weed Science Breakfast Tuesday morning, Corteva sponsoring the Student Luncheon Tuesday at noon, and Syngenta Crop Protection sponsoring the Industry Breakfast on Thursday morning. The society mixer Wednesday evening is supported by all Sustaining Members.

The Society succeeds when its members are engaged. We are all blessed by those who serve as contest judges, on committees, as moderators, and on the Board of Directors. If you are not yet serving and wish to do so, please reach out to me, Dawn Refsell, Brett, Miller, or Fritz Koppatschek.

In the Fall Newsletter I extended the invitation to think about the following questions:

- How might we innovate in ways that expand the membership and creativity of our society?
- How might we innovate in ways that enable us to control rapidly evolving weeds like waterhemp?

NCWSS Program

If you have thoughts on these questions, please share them with a member of the Strategic Planning Committee or Board of Directors.

In the 2024 NCWSS member survey, networking with other members and learning from oral and poster papers were ranked as the most valuable components of Society membership and attending the Annual Meeting. For me the NCWSS has always been a welcoming meeting. I hope you feel the same during this 80th Annual Meeting. Please remember that: “People just want to be invited;” “It is YOUR presence that makes the party;” and “We should be about blessing instead of impressing” (Sarah Harmeyer).

Thank you for the opportunity to serve as NCWSS President! Have a great Annual Meeting, and smile for the camera if you get the chance!

Mark Bernards

Conference Headquarters

All sessions of the conference and the meeting events will be held at the Amway Grand Plaza, 187 Monroe NW, Grand Rapids, MI 49503

Registration Hours

The registration desk is at **Registration 2**, and will be open Monday 3 to 6:30 pm, Tuesday 7:30 am to 4 pm, Wednesday 8 to 11 am and 2 to 4 pm.

Meeting Rooms

All sessions and meetings will be in Amway Grand Plaza. Additional meetings may be arranged any time during the conference by contacting Christy Sprague, Local Arrangements Chair.

Proceedings

2025 NCWSS Proceedings will be available following the meeting online at the NCWSS website.

Sustaining Members

Sustaining members that have made prior arrangements with the Industry Chair may put up a display in the Exhibit area. No other displays are allowed.

Endowment Support Opportunity – Silent Auction

Silent auction items will be available for viewing and bidding near the registration desk until Wednesday at 3 pm.

Bid online with the following QR code:



NCWSS Program

Auction items winners may pick up items beginning at 5 pm Wednesday evening at the registration desk. Proceeds from the Silent Auction will be placed into the NCWSS Endowment Fund.

Health and Safety

Attendees need to always wear NCWSS name badges. Please always keep your personal belongings with you. Smoking is allowed in designated areas only. In the event of any medical emergency, please contact hotel security as soon as possible through any public area house phone or by dialing the hotel operator and stating that you have a medical emergency.

Please contribute to the conference environment in which diverse attendees may learn, network, and enjoy the company of colleagues in a professional and harassment-free atmosphere.

The NCWSS believes in and supports the laws designated to keep our Society safe and designed to protect the environment. If you believe that an unsafe condition exists in our Society, bring it immediately to the attention of the President, a member of the Board, or Executive Secretary. If an incident takes place, report it pursuant to policy and immediately take action to address the problem. Any incident or situation that violates the law or this policy should be immediately reported to the Executive Secretary; in person or via this contact information: info@ncwss.org or 720-445-4789.

NCWSS on Social Media

Keep up to date with the latest NCWSS news by following @NCWeedScience on X. Use the hash tag #NCWSS2025 when sharing on LinkedIn, X, Instagram, or other social media platforms.

No photographs or videos

Please Do Not take pictures or videos of any presentations without prior permission from the presenter. The posters will be available online after the conference.

Program Symbols

- * Presenting Author
- † Paper or poster in the graduate student contest
- ‡ Poster in the undergraduate student contest

Meal Functions of the Society 2025

Meal Functions

If you requested specific dietary needs during the meeting, please identify yourself and needs to the wait staff as they begin serving.

Breaks

Tuesday 9:30–10:00 am	Crown Foyer
Tuesday 3:15–3:30 pm	Crown Foyer & North Concourse
Wednesday 7:00–8:30 am	Center Concourse
Wednesday 9:45–10:00 am	North Concourse
Wednesday 3:15–3:30 pm	Imperial & North Concourse

Presidential Reception

Open to 2025 Distinguished Award Winners, New and Current Fellows, Current Board Members

Monday, 6:00 – 7:00 pm Pantlind

Student Mixer

Sponsored by BASF Corporation – Open to all

Monday, 6:30 – 10:00 pm Imperial

Women in Weed Science Networking Breakfast

Sponsored by Bayer - Open to all (preregistration required)

Tuesday, 6:30 – 8:00 am Pantlind

Student Luncheon/Business Meeting

Sponsored by Corteva Agriscience – Open to all students

Tuesday, 12:00 – 1:15 pm Pantlind

Society Award Luncheon

Open to all (preregistration required)

Wednesday, 12:00 – 1:15 pm Ambassador

Society Social

Sponsored by Sustaining Members – Open to all

Wednesday, 5:30-7:00 pm Pantlind

Society Industry Breakfast

Sponsored by Syngenta – Open to all (preregistration required)

Thursday, 7:00 – 8:15 am Ambassador

Student Contest Awards at Industry Breakfast

Open to all attendees

Thursday, 8:15 – 8:45 am Ambassador

NCWSS Committee Meetings

Meetings will take place to conduct the business of each respective committee. Most meetings are open to members. Please contact the committee chair or attend the committee meeting if you are interested in serving the society by being a committee member. * Denotes committees that will elect a new Vice Chair to serve as Chair in 2025.

Board of Directors

Monday, 1:00-4:30 pm Pearl

Finance, Steering & Policy

Monday, 4:30-5:30 pm Pearl

Resident Education, Summer Contest & Contest

Rules Joint meeting

Monday, 4:30-5:30 pm Governors

Paper Judges

Monday, 5:30-6:30 pm Governors

Tuesday, 5:30-6:30 pm Vandenburg A

Poster Judges

Monday, 5:30-6:30 pm Governors

Tuesday, 5:30-6:30 pm Vandenburg B

Resolutions & Necrology

Monday, 5:30-6:00 pm Pearl

Program Committee & Section Chairs

Monday, 6:30-7:30 pm Governors

Nominating

Tuesday, 5:15-6:00 pm Lyon

Fellows

Tuesday, 5:30-6:00 pm Pearl

Strategic Planning

Tuesday, 6:00-7:00 pm Pearl

Distinguished Achievement Awards

Tuesday, 6:00-6:30 pm Lyon

Industry

Thursday, 10:00 am (after What's New...) Ambassador

Board of Directors

Thursday, 10:00 – 11:00 am Pearl

Meetings of the Society 2025

Program Section Business Meetings

Extension

Wednesday, 9:30 am Vandenburg A

Weed Genetics & Herbicide Physiology (WG&HP)

Wednesday, 11:30 am Vandenburg B

Weed Biology & Ecology (WB&E)

Wednesday, 11:30 am Vandenburg B

Range, Pasture, & Vegetation Management (RP&VM)

Wednesday, 11:30 am Imperial

Row Crop Herbicides (RCH)

Wednesday, 11:30 am Governors

Horticulture & Specialty Crops (H&SC)

Wednesday, 4:00 pm Vandenburg A

Cover Crops & Integrated Weed Management (CC&IWM)

Wednesday, 4:00 pm Vandenburg B

Equipment & Application Technology (EA)

Wednesday, 4:00 pm Vandenburg B

Symposia

The Impact & Future for Biologicals as Agrochemical Management Practices & Solutions

Wednesday, 8:30-10:50 am Imperial

What's New in Extension

Wednesday, 10:00-11:50 am Vandenburg A

The Drone Revolution in Weed Science: Market, Science & Retail

Wednesday, 1:30-5:00 pm Governors

What's New in Industry

Thursday, 8:45-10:00 am Ambassador

Graduate Student Symposium

Building Your Future: Career Development & Interview Strategies

Wednesday, 1:30-5:00 pm Imperial

NCWSS Program

Condensed Program

Monday

Committee meetings 4:30-7:30 pm Various

Student Mixer 6:30-10:00 pm Imperial

Tuesday

Women in Weed Science Breakfast 6:30-8:00 am Pantlind

POSTER SESSION 1 – Student Contest 8:00-9:50 am Center Concourse

General Session 10:00-11:50 am Ambassador

Student Luncheon 12:00-1:15 pm Pantlind

Student Contest (RCH, CC&IWM) 1:30-5:15 pm Ambassador East

Student Contest (WG, WB&E) 1:30-4:45 pm Ambassador West

Student Contest (H&SC, EA, CC&IWM) 1:30-5:00 pm Vandenburg A

Student Extension Video Contest 3:30-4:30 pm Vandenburg B

Wednesday

POSTER SESSION 2 7:00-8:30 am Center Concourse

Symposium - Impact and Future for Biologicals 8:30-10:50 am Imperial

Range, Pasture & Vegetation Management 11:00-11:45 am Imperial

Extension & *Symposium* -What's New in Extension 8:30-11:50 am Vandenburg A

Row Crop Herbicides 9:15-11:45 am Governors

NCWSS Program

Weed Genetics & Physiology, Biology & Ecology	8:45-11:45 am	Vandenberg B
Society Awards Luncheon	12:00-1:15 pm	Ambassador
<i>Student Symposium - Building Your Future</i>	1:30-5:00 pm	Imperial
<i>Symposium - Drones in Weed Science</i>	1:30-5:00 pm	Governors
Horticulture & Specialty Crops	1:30-4:15 pm	Vandenburg A
Cover Crop & Integrated Weed Mgt, Equipment & Application Tech	1:30-4:30 pm	Vandenburg B
Society Social	5:30-7:00 pm	Pantlind
Thursday		
Society Industry Breakfast & Speaker	7:00-8:15 am	Ambassador
Student Contest Awards	8:15-8:45 am	Ambassador
<i>Symposium - What's New in Industry</i>	8:45-10:00 am	Ambassador

NCWSS Program

Poster Sessions

LOCATION: Center Concourse
CHAIRS: Nicholas Stepping
 BASF
 Joseph Ikley
 North Dakota State University

Poster Setup

Posters can be set up between 4:00 and 8:00 pm on Monday, December 15. All NCWSS posters will be on display on Tuesday, December 16 from 8:00 am until 7:00 pm and on Wednesday, December 17 from 7:00 am until 12:00 pm.

Students in the Poster Contest must be with their posters during the Poster Sessions on Tuesday morning for judging. Students in the poster contest are *required* to bring at least 25 letter-sized copies of your posters to hand out.

Tuesday, December 16

8:00 – 9:50 am Poster Session I – Student Contest

Wednesday, December 17

7:00 – 8:30 am Poster Session II

Poster Removal

All posters must be removed by 4:00 pm on Wednesday, December 17.

NCWSS Sustaining Member Exhibitors

Tuesday & Wednesday Center Concourse
Set up Monday afternoon

Program Symbols

- * Presenting Author
- † Paper or poster in the graduate student contest
- ‡ Poster in the undergraduate student contest

PROGRAM

TUESDAY MORNING DECEMBER 16

Women in Weed Science Breakfast

LOCATION: Pantlind
TIME: 6:30 AM – 8:00 AM EST
CHAIR: Cristin Weber
Syngenta Crop Protection

6:30 AM Meal Served (Preregistration Required)

TUESDAY MORNING DECEMBER 16

POSTER SESSION 1 – Student Contest

LOCATION: Center Concourse
TIME: 8:00 AM - 9:50 AM EST

***PRESENTER**

† GRADUATE CONTEST

‡ UNDERGRADUATE CONTEST

All student contest participants (†, ‡) are to be at posters on Tuesday, 8:00 AM - 9:50 AM

All presenters not participating in the student contest are to be at posters on Wednesday, 7:00 AM - 8:30 AM

POSTER SECTION

Cover Crops and Integrated Weed Management

† **Cereal Rye, Termination Timing and Herbicide Programs: Evaluating Waterhemp Management in a Corn-Soybean Rotation.** Bayron Hernandez*¹, Anthony Dobbels¹, Colin Barclay¹, Laura Lindsey¹, Eugene Law¹, Alyssa Essman¹; ¹The Ohio State University (1)

Planted Green: When to Spray? Mark VanGessel*¹, Barbara Scott¹; ¹University of Delaware (2)

‡ **Got Herbicide Resistant Weeds?** Chloe Hall*¹, Alyssa Essman¹, Bruce Ackley¹; ¹The Ohio State University (3)

Insect and Weed Control with Propane Flaming in Mature Organic Alfalfa. Stevan Knezevic*¹, Jon Scott¹, Luka Milosevic¹; ¹University of Nebraska–Lincoln (4)

† **Evaluating Winter Barley as a Cover Crop for Summer Annual Weed Suppression.** Eduardo Lago*¹, Eric Miller¹, Karla Gage¹; ¹Southern Illinois University (5)

Effect of Fall-planted Cover Crop and Tillage on Management of *Ambrosia* spp. and Soybean Yield. Isidor Ceperkovic*¹, Datta Chiruvelli¹, Angie Peltier¹, Sithin Mathew¹, Debalin Sarangi¹; ¹University of Minnesota (6)

† **Interactive Effect of Cereal Rye (*Secale cereale*) Termination Timing and Soil Residual Herbicide Application on Waterhemp (*Amaranthus tuberculatus*) Control in Soybeans.** Grace Milligan*¹, Eric Miller¹, Grant Hoffer², Karla Gage¹, John Wallace²; ¹Southern Illinois University, ²Pennsylvania State University (7)

Impact of Cereal Rye Cover Crop Termination Time on Corn Yield in Planting Green Systems. Ryan DeWerff*¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison (8)

† **Effects of Rye Cover Crop, Adjuvant Use, and Residual Herbicide on *Amaranthus palmeri* Control in Soybean.** Joaquin Enrria*¹, Larry Rains¹, J. Anita Dille¹; ¹Kansas State University (9)

‡ **Impact of Seedbank Density, Cover Crop Mulch, and Preemergence Herbicides on *Amaranthus tuberculatus* Management.** Livia Venturi*¹, Alice Lazzari¹, Sabeel Abuhakmeh¹, Ahmadreza Mobli¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison (10)

NCWSS Program

Understanding Weed Demographic Responses to Management Practices in the Midwest Through Density-Dependent Matrix Modeling. Mercy Odemba*¹, John Wallace², Mark VanGessel³, Nicholas Basinger⁴, Karla Gage⁵, Aaron Hager⁶, Erin Haramoto⁷, John Lindquist⁸, Steven Mirsky⁹, Wes Everman¹⁰, Grant Hoffer², Eugene Law¹; ¹The Ohio State University, ²The Pennsylvania State University, ³University of Delaware, ⁴University of Georgia, ⁵Southern Illinois University, ⁶University of Illinois, ⁷University of Kentucky, ⁸University of Nebraska-Lincoln, ⁹USDA-ARS, ¹⁰Iowa State University (11)

† Influence of Planting Date and Tillage on Diflufenican Efficacy and Crop Response. Madison Hackstadt*¹, Eric Miller¹, Karla Gage¹; ¹Southern Illinois University (12)

Developing Computer Vision-Based Weed and Crop Mapping Technology. Daniel Doretto*¹, Michael Grimes¹, Kyle Ohanian¹, Mercy Odemba¹, Colin Barclay¹, Anthony Dobbels¹, Alyssa Essman¹, Maria Laura Cangiano², Zachary Grzywacz², Steven Mirsky³, Eugene Law¹; ¹The Ohio State University, ²North Carolina State University, ³USDA-ARS (13)

† Optimizing Cover Crops, Nitrogen, and Herbicide Integration for Weed Management in Sweet Corn. Newman Teye-Doku*¹, Ramawatar Yadav¹, Velez Andrea Maribel¹, Miriam Styer¹, Allison Robinson¹; ¹The Ohio State University (14)

‡ Evaluating variety, application timing, and herbicide program for annual ryegrass termination. Sarah Hoak*¹, Anthony Dobbels¹, Alyssa Essman¹; ¹The Ohio State University (16)

Effects of fall- and spring-planted cover crops on kochia and Palmer amaranth suppression in dryland production systems of western Kansas. Olumide Daramola*¹, Jeremie Kouame¹, Atong Akom¹, Taylor Lambert¹, Augustine Obour¹, Anita Dille¹, Johnathan Holman¹; ¹Kansas State University (17)

† The Space Between: Can Inter-planted soybeans improve weed management due to early-season suppression? Zachary Ury*¹, Kevin Bradley¹; ¹University of Missouri (18)

POSTER SECTION

Extension

NCWSS Program

PEST Academy. Milos Zaric*¹; ¹University of Nebraska-Lincoln WCREEC (19)

Spray Savings and Weed Control from Targeted Herbicide Applications in Corn and Soybean Fields. Guilherme Sousa Alves¹, Stephen Schwartz², Lance Frahm², Zaim Ugljic¹, Arthur F. T. Duarte¹, Rodrigo Werle*¹; ¹University of Wisconsin-Madison, ²John Deere (20)

† Identification of Established Blackgrass (*Alopecurus myosuroides*) Population in Illinois: Prediction and Mitigation of Expansion. Alexander R. Mueth*¹, Bryan G. Young¹; ¹Purdue University (21)

Cereal Rye Cover Crop Biomass Guide: A Practical Resource for Practitioners. Guilherme Chudzik*¹, Eric Yu², Bailey Tangen², Jose Nunes³, Karla Gage⁴, Sarah Lancaster⁵, Travis Legleiter⁶, Joe Ikley⁷, Jason Norsworthy⁸, Bryan Young⁹, William Johnson⁹, Kevin Bradley¹⁰, Alyssa Essman¹¹, Christy Sprague¹², Vipin Kumar¹³, Ryan DeWerff¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison, ²University of Minnesota Extension, ³Syngenta Crop Protection, ⁴Southern Illinois University, ⁵Kansas State University, ⁶University of Kentucky, ⁷North Dakota State University, ⁸University of Arkansas, ⁹Purdue University, ¹⁰University of Missouri, ¹¹The Ohio State University, ¹²Michigan State University, ¹³University of Nebraska-Lincoln, (22)

POSTER SECTION

Equipment & Application Technology

† Assessing Nozzle Suitability for Targeted Bioherbicide Spray Systems Applications for Specialty Crops. Milos Zaric¹, Rasmita Mainali*¹, Jeff Golus¹; ¹University of Nebraska-Lincoln WCREEC (23)

† Efficacy of robotic mechanical weed control in Michigan cabbage. Daniel Brainard¹, Akane Takenaka*¹; ¹Michigan State University (24)

Spray Water Quality: An Overlooked Factor in Herbicide Performance. Eric Yu*¹, Ryan Miller¹; ¹University of Minnesota (25)

Reverse Osmosis Water: Can It Aid Herbicide Efficacy? Jeffrey Golus*¹, Breno Rodrigues¹, Rasmita Mainali¹, Milos Zaric¹; ¹University of Nebraska-Lincoln WCREEC (27)

NCWSS Program

† **Impact of Water Type (Hard Water vs. Reverse Osmosis) on 2,4-D and Glufosinate-L Spray Deposition and Weed Efficacy.** Breno Rodrigues*¹, Rasmita Mainali¹, Kasey Schroeder¹, Jeffrey Golus¹, Milos Zaric¹; ¹University of Nebraska-Lincoln WCREEC (28)

Evaluation of HM2113 Adjuvant in Glufosinate Weed Control Program. Gregory Willoughby*¹, Austin Anderson¹, Nicholas Hurdle¹; ¹Helena AgriEnterprises (29)

† **Using Drone Imagery to Assess Herbicide Application Success and Guide Respray Decisions.** Emmanuel G Cooper*¹, Maria Carolina CR Souza¹, Leonard B Piveta¹, Julie M Young¹, Bryan G Young¹, Thomas R Butts¹; ¹Purdue University (30)

Spray Particle Drift from Targeted and Broadcast Herbicide Applications. Guilherme Sousa Alves¹, Jesaelen G. Moraes², Debora O. Latorre³, Alice Lazzari¹, Livia Venturi¹, Luma Lorena L. S. Rodrigues¹, Sabeel Abuhakmeh¹, Milos Zaric⁴, Rodrigo Werle*¹; ¹University of Wisconsin-Madison ²Blue River Technology, ³Teejet Technologies, ⁴University of Nebraska-Lincoln (31)

† **Dose-Response of Palmer amaranth (*Amaranthus palmeri* S. Watson) to Glufosinate-L with and without AMS and MSO Using AIXR and TTJ Nozzles.** Gustavo Fujihara*¹, Rasmita Mainali¹, Kasey Schroeder¹, Jeff Golus¹, Milos Zaric¹; ¹University of Nebraska-Lincoln WCREEC (32)

Spray Deposition from Targeted Herbicide Applications Through Different Nozzle Types. Guilherme Sousa Alves¹, Livia Venturi¹, Luma Lorena L. S. Rodrigues¹, Guilherme Chudzik¹, Sabeel Abuhakmeh¹, Daniel Zhu¹, Milos Zaric², Rodrigo Werle*¹; ¹University of Wisconsin-Madison ²University of Nebraska-Lincoln (33)

† **Can Historical Weed Density Maps Guide Variable-Rate Residual Herbicide Applications in Soybean?** Igor Rezende Lima*¹, Sarah Lancaster¹, Lalit Mohan¹, Yasir Parrey¹, Lucas Freitas Granzioli^{1, 2}, Joao M. Stempniak Accetti^{1, 2}, Landon Duff¹; ¹Kansas State University, ²State University of Maringa (34)

† **Effect of Nozzle Orientation and Boom Height on Spray Coverage and Weed Control in Targeted Herbicide Application Systems.** Zaim Ugljic*¹, Ryan DeWerff¹, Ahmadreza Mobli¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison (35)

NCWSS Program

Effect of Herbicide, Spray Nozzle Type, and Carrier Volume on Waterhemp Control in Corn and Soybean. Estefania Polli*¹, Alex Macvilay¹, Damian Franzenburg¹, Tunde Akanbi¹, Wesley Everman¹; ¹Iowa State University (36)

† Crop Injury from Postemergence Applications of the Encapsulated Saflufenacil + Pyroxasulfone Premixture is Influenced by Application Time of Day. Jada N. Davis*¹, Julie M. Young¹, Thomas R. Butts¹, Bryan G. Young¹; ¹Purdue University (37)

System Sensitivity, Nozzle Type, and Boom Height Effects on Targeted Herbicide Application Outcomes. Guilherme Sousa Alves¹, Stephen Schwartz², Lance Frahm², Jesaelen G. Moraes³, Zaim Ugljic¹, Alice Lazzari¹, Livia Venturi¹, Luma Lorena L. S. Rodrigues¹, Guilherme Chudzik¹, Sabeel Abuhakmeh¹, Nikola Arsenijevic¹, Ahmadreza Mobli¹, Daniel Zhu¹, Ryan DeWerff¹, Rodrigo Werle*¹; ¹University of Wisconsin-Madison, ²John Deere, ³Blue River Technology (38)

‡ Droplet Size, Drift Risk, and Deposition Patterns of Selected Coarse and Very Coarse Nozzles. Ana Laura Camachos de Oliveira*¹, Laurel Daily¹, Rasmita Mainali¹, Breno Rodrigues¹, Jeffrey Golus¹, Milos Zaric¹; ¹University of Nebraska-Lincoln WCREEC (39)

Evaluation of late-season weed control in soybean using unmanned aerial vehicles (UAV) and ground sprayers in dryland production systems of western Kansas. Olumide Daramola*¹, Jeremie Kouame¹, Bryan Young², Thomas Butt², Julie Young², Sarah Lancaster¹, Rodrigo Werle³, Kevin Bradley⁴, Alyssa Essman⁵, Eric Miller⁶, Karla Gage Gage⁶, Aaron Hager⁷, Joe Ikley⁸, Travis Legleiter⁹, Thomas Mueller¹⁰, Jason Norsworthy¹¹, Christy Sprague¹², Lawrence Steckel¹⁰; ¹Kansas State University, ²Purdue University, ³University of Wisconsin-Madison, ⁴University of Missouri, ⁵The Ohio State University, ⁶Southern Illinois University, ⁷University of Illinois, ⁸North Dakota State University, ⁹University of Kentucky, ¹⁰University of Tennessee, ¹¹University of Arkansas, ¹²Michigan State University (40)

† Spray Equipment (Drone vs Ground Sprayer) and Droplet Size Effects on a Full-Season Herbicide Program in Corn. Maria Carolina CR Souza*¹, Emmanuel G Cooper¹, Estevan G Cason¹, Leonard B Piveta¹, Julie M Young¹, Bryan G Young¹, Thomas R Butts¹; ¹Purdue University (41)

NCWSS Program

Waterhemp (*Amaranthus tuberculatus*) control and spray droplet coverage with various spray volumes applied with a drone. Brian Stiles II*¹, Christy Sprague¹; ¹Michigan State University (42)

† Comparing Application Performance of a UAV and Ground Sprayer for Pre-emergent Herbicide Application in Soybean. Jesse Yount*¹, Kevin Bradley¹; ¹University of Missouri (43)

† Influence of Crop and Weed Canopy on Spray Deposition and Coverage of Understory Weeds. Nikola Arsenijevic*¹, Zaim Ugljic¹, Daniel Zhu¹, Ahmadreza Mobli¹, Ryan DeWerff¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison (44)

POSTER SECTION **Horticulture & Specialty Crops**

† Effect of Application Timing on Peppermint (*Mentha x piperita*) Tolerance to Ethofumesate Post-Cutting Under Greenhouse Conditions. Nicolle Salamanca*¹, Stephen Meyers¹, Celia Corado¹, Jeanine Arana¹; ¹Purdue University (45)

† Pumpkin Responses to Cereal Rye Termination and Burndown. Helen Nocito*¹, Stephen Meyers¹, Celia Mendoza¹, Jeanine Arana¹, Josue Cerritos^{1, 2}, Carlos Manzano^{1, 3}, Lidysce Mata^{1, 4}, Nicolle Salamanca¹, Valeria Fonesca¹; ¹Purdue University, ²Corteva Agriscience, ³Concordia University, ⁴University of Florida (46)

Performance of Terbacil on Newly Established Caneberries. Allison Robinson*¹, Ramawatar Yadav¹, Andrea Maribel Velez Matute¹, Laura Tatiana Perez Forero¹; ¹The Ohio State University (47)

† Planting Date Effects on Waterhemp (*Amaranthus tuberculatus*) Management in Dry Edible Beans. Jacob H. Felsman*¹, Brian J. Stiles II¹, Christy L. Sprague¹; ¹Michigan State University (48)

† A Comparison of Pre- and Post-Planting Weed Management Strategies for Small-Scale Onion Production. Celia Corado*¹, Stephen Meyers¹, Petrus Langenhoven¹, Josue Cerritos², Jeanine Arana¹, Helen Nocito¹, Nicolle Salamanca¹; ¹Purdue University, ²Corteva (49)

IR-4 Project: Success and Benefits to Specialty Crop Growers. Roger Batts*¹, Jaimin Patel¹, Philip Moore¹, Alice Axtell¹, Debbie Carpenter¹, Jerry Baron¹; ¹IR-4 Project (50)

NCWSS Program

† **Fall or Spring: When is the Best Time for Herbicide Applications in Winter Wheat?** Kaddi Gewirtz*¹, Christy Sprague¹; ¹Michigan State University (51)

† **Using Cereal Rye Cover Crop for Weed Control in Vegetable Production Systems.** Miriam Grace Styer*¹, Ramawater Yadav¹, Andrea Maribel Velez Matute¹, Newman Benjamin Teye-Doku¹, Allison Marcela Robinson¹; ¹The Ohio State University (52)

Bioherbicides for Weed Control: Opportunities and Challenges. Milan Brankov*¹, Breno Rodrigues², Jeffrey Golus², Kasey Schroeder², Milos Zanic²; ¹Maize Research Institute “Zemun Polje”, ²University of Nebraska-Lincoln WCREEC (53)

POSTER SECTION

Pasture, Range & Vegetation Management

Effects of PGR Rate and Timing on Roadside Turf. Joe Omielan*¹; ¹University of Kentucky (54)

POSTER SECTION

Row Crop Herbicides

† **Integrated Management of Volunteer Corn in Corn.** Alex Chmielewski*¹, Mandeep Singh¹, Amit J. Jhala¹; ¹University of Nebraska-Lincoln (55)

Winger: New Pyroxasulfone Formulations from UPL NA Inc. Matthew Jenkins*¹, Ryan Henry¹, Ryan Bryant¹, Kathryn Ruddy¹; ¹UPL (56)

‡ **Do Soil Moisture at Application and Subsequent Rainfall Timing Dictate Preemergence Herbicide Efficacy?** Alice Lazzari*¹, Ahmadreza Mobli¹, Guilherme Chudzik¹, Livia Venturi¹, Sabeel Abuhakmeh¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison (57)

Do Postemergence Applications with Group 15 Herbicides Improve End-of-Season Waterhemp Control and Soybean Yield? Seven Years of Wisconsin Data. Ryan DeWerff*¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison (58)

† **The Efficacy of Premixes and Application Timing in Reduced Atrazine Programs.** Alyson Godwin*¹, Alyssa Essman¹, Alexander Lindsey¹, Osler Ortez¹, Colin Barclay¹, Anthony Dobbels¹; ¹The Ohio State University (59)

NCWSS Program

Optimizing Weed Control with Diflufenican in Soybean Production: The Impact of Tillage and Application Timing on Soil Residual Activity. Abigail N. Norsworthy*¹, Julie M. Young¹, Bryan G. Young¹; ¹Purdue University (60)

† Optimization of Rapidilicil® Dose and Adjuvant Type for Control of Palmer amaranth (*Amaranthus palmeri*), cheatgrass (*Bromus tectorum*), common ragweed (*Ambrosia artemisiifolia*), and kochia (*Bassia scoparia*). Ankit Yadav*¹, Garrison Gundy², Pat Clay², Amit Jahal¹; ¹University of Nebraska-Lincoln, ²Valent USA (61)

Dose-Response of Select Missouri Waterhemp Populations to Glufosinate, Dicamba, and 2, 4-D. Trace Thompson*¹; ¹University of Missouri (62)

† Soil and Precipitation Effects on Preemergence Herbicide Efficacy on Waterhemp (*Amaranthus tuberculatus*) and Kochia (*Bassia scoparia*). Carson Hought*¹, Joseph Ikley¹; ¹North Dakota State University (63)

2,4-D and glufosinate applied alone or mixed during the day and night: weed control and soybean yield Implications. Eric Jones*¹, Sachin Dhanda¹, Jill Alms¹, David Vos¹; ¹South Dakota State University (64)

† Atrazine Alternative PSII- and HPPD-Inhibitor Tank Mixes for Improved Weed Control in Wisconsin Corn Production Systems. Daniel Zhu*¹, Ryan DeWerff¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison (65)

Surtain Herbicide: Label Expansion for Weed Management in Popcorn and Processing Sweet Corn. Sanjeev Bangarwa¹, Josh Putman¹, Sam Willingham¹, Ethann Barnes¹, John Frihauf¹, Nick Steppig*¹, Matt Osterholt¹, Eric Schultz¹; ¹BASF Corporation (66)

† Soybean Planting Date and Metribuzin Rate on Waterhemp Control, Crop Injury and Yield. Ella Poling*¹, Laura Lindsey¹, Stephanie Karhoff¹, Colin Barclay¹, Anthony Dobbels¹, Alyssa Essman¹; ¹The Ohio State University (67)

Confirmation of Multiple Herbicide-Resistant Kochia in South Dakota. Sachin Dhanda*¹, Jill Alms¹, David Vos¹, Eric Jones¹; ¹South Dakota State University (68)

NCWSS Program

‡ **Evaluation of Corn Herbicide Tank-Mixes for Postemergence Control of Summer Annual Grasses in Glyphosate- and Atrazine- Restricted Systems.** Gage Anderson*¹, Daniel Zhu¹, Ahmadreza Mobli¹, Rodrigo Werle¹; University of Wisconsin-Madison (69)

Spring Oats and Weedy Grass Herbicides. Dwight Lingenfelter*¹, Christy Sprague²; ¹Penn State University, University Park, PA, ²Michigan State University (70)

† **Investigation of Pyridate and HPPD-Inhibitor Mixtures in a Controlled Environment.** Grant D. Isaacs*¹, Alexander R. Mueth¹, Mearaj A. Shaikh¹, Joshua R. Widhalm¹, Bryan G. Young¹; ¹Purdue University (71)

Relative Volatility of Amicarbazone, Atrazine, and Metribuzin Under Lab Conditions. Ryan Henry*¹, Thomas Mueller²; ¹UPL NA Inc., ²University of Tennessee (72)

† **Pre-Emerge Herbicide Affect on Iron Deficiency Chlorosis Severity in Different Soybean Cultivars.** Jack Roehl*¹, Joseph Ikley¹; ¹North Dakota State University (73)

Resicore® Rev: The Foundational Choice for Weed Control in Corn. Kristin Rosenbaum*¹, Kelly Backscheider¹, Kevin Johnson¹, Lowell Sandell¹, Claudio Vrisman¹, Lucas OliveiraRibeiroMaia¹, Spencer Samuelson¹; ¹Corteva Agriscience (74)

‡ **Timing of Overlapping Residual Herbicide Applications in Corn.** João Matheus Stempniak Accetti*^{1,2}, Lucas de Freitas Granzioli^{1,2}, Lalit Mohan¹, Victoria Johnson¹, Igor Rezende Lima¹, Sarah Lancaster¹; ¹Kansas State University, ²State University of Maringá (75)

Postemergence Herbicides for the Control of Multiple-Herbicide-Resistant Canada Fleabane in Corn. Nader Soltani*¹, Isabelle Aicklen¹, Christian Willemse¹, Peter Sikkema¹; ¹University of Guelph (76)

† **Emergence Timing of Shattercane (*Sorghum bicolor* L.) and Implications for Management in Corn.** Lidia K. Myers*¹, Reid J. Smeda¹, George Oganda¹, Caden Oconnor¹; ¹University of Missouri (77)

Winter wheat tolerance to clopyralid applied in the fall, spring, or fall followed by spring. Nader Soltani*¹, Isabelle Aicklen¹, Christy Shropshire¹, Peter Sikkema¹; ¹University of Guelph (78)

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† **Evaluation of Multiple Two-Way Herbicide Tank Mixes to Support Effective Postemergence Waterhemp Control in Wisconsin.** Sabeel Abuhakmeh*¹, Ahmadreza Mobli¹, Daniel Zhu¹, Luma Lorena Loureiro da Silva Rodrigues¹, Livia Venturi¹, Alice Lazzari¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison (79)

Utilizing Epyrifenacil (Rapidicil®) for Termination of a Failed Stand of Corn. Sam Noe*¹, Matt Griffin¹, Eric Ott¹, Garrison Gundy¹, Chad Smith¹, Nathan Drewitz¹, Pat Clay¹; ¹Valent USA LLC (80)

† **Effect of Overlapping Residual Herbicide Program on Seed Production of Palmer Amaranth in Irrigated Sorghum (*Sorghum bicolor* (L.) Moench).** Sai Suvidh Maddela*¹, Amit J. Jhala¹; ¹University of Nebraska-Lincoln (81)

† **Tank-Mix of HPPD and PSII Inhibitor Herbicides for Postemergence Control of HPPD-Resistant Waterhemp.** Tunde Akanbi*¹, Estefania Gomiero Polli¹, Itthiphonh Alex Macvilay¹, Damian Franzenburg¹, Wesley Everman¹; ¹Iowa State University (82)

POSTER SECTION **Weed Biology & Ecology**

† **Common Purslane (*Portulaca oleracea*) and Redroot Pigweed (*Amaranthus retroflexus*) Management Strategies on Ohio Organic Soils.** Andrea Maribel Velez Matute*¹, Ramawatar Yadav¹, Newman Benjamin Teye-Doku¹, Miriam Grace Styer¹, Catherine Papp Herms¹; ¹The Ohio state University (83)

† **Emergence Patterns and Reproductive Potential of Goosegrass.** Caden O'Connor*¹, Reid Smeda¹; ¹Univeristy of Missouri (84)

Emergence Patterns of Offspring from Early- and Late-Emerging Waterhemp (*Amaranthus tuberculatus*) Cohorts in Wisconsin. Ahmadreza Mobli*¹, Sarah Kezar¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison (85)

† **Effect of Light Quality and Incubation Period on Seed Germination of Summer Annual Weeds.** Datta Chiruvelli*¹, Roger Becker¹, Amit Jhala², David Moeller¹, Debalin Sarangi¹; ¹University of Minnesota, ²University of Nebraska-Lincoln (86)

NCWSS Program

Application Timing Effect of Saflufenacil and Pyroxasulfone in Tank Mix and Pre Mix. Kasey Schroeder*¹, Mason Glascock¹, Rasmita Mainali¹, Breno Rodrigues¹, Jeffrey Golus¹, Milos Zanic¹; ¹University of Nebraska-Lincoln WCREEC (87)

‡ Quantifying Response of Plant Communities to Landscape Scale Farm Management Practices. Kyle Ohanian*¹, Qiao Li¹, Michael Grimes¹, Daniel Doretto¹, Mercy Odemba¹, Eugene Law¹; ¹The Ohio State University (88)

Asian copperleaf response to common postemergence herbicides. Wesley Everman*¹, Meaghan Anderson¹, Iththiphonh Macvilay¹; ¹Iowa State University (89)

† Short Stature Corn Maternal Effects on Growth and Competitive Ability of Common lambsquarters (*Chenopodium album*). Kyle Elizalde*¹, Erin Burns¹; ¹Michigan State University (90)

Response of Global *Parthenium hysterophorus* Populations to POST Herbicides. Antonio DiTommaso¹, Sarah Kezar*², Vipin Kumar¹, Caio Brunharo³; ¹Cornell University, ²University of Wisconsin-Madison, ³Pennsylvania State University (91)

‡ Determining Emergence Windows of Major Agronomic Weeds in Ohio. Michael Grimes*¹, Mercy Odemba¹, Daniel Doretto¹, Eugene Law¹; ¹The Ohio State University (92)

Environmental Factors Influencing the Differential Response of Resistant and Susceptible Waterhemp (*Amaranthus tuberculatus*) Populations to Glufosinate-ammonium. Isabel Werle Noe*¹, Logan Miller¹, Estéfani Sulzbach¹, Damilola A. Raiyemo¹, Alexander J. Lopez¹, Aaron G. Hager¹, Patrick J. Tranel¹; ¹University of Illinois (93)

† Impacts of Duration of Weed Competition on Weed Community Composition in Short vs. Traditional Stature Corn. Nathan Welch*¹, Erin Burns¹; ¹Michigan State University (94)

Phytohormonal and Transcriptomic Mechanisms of Multigenerational Stress Memory in Wheat Under Weed Competition. Albert Kwarteng*¹, Albert Adjesiwor², Ian Burke³, Joseph Kuhl⁴, Brenda Murdoch⁴, Fangming Xiao²; ¹Lincoln University, ²University of Idaho, ³North Carolina State University, ⁴University of Idaho (95)

POSTER SECTION

Weed Genetics & Herbicide Physiology

† **Metabolism of mesotrione confers resistance in CYP transgene expressed wheat.** Akshitha Reddy Bynegeri*¹, Susee Sudhakar², Vara Prasad PV¹, Mithila Jugulam³; ¹Kansas State University, ²University of Arkansas, ³Texas A&M University (96)

† **Investigating the Mechanism of Dicamba Resistance in a Population of *Amaranthus tuberculatus* from Illinois Through Integrated Metabolome and Transcriptome Profiling.** Alexander Lopez*¹, Amit Rai¹, Mainak Dutta¹, Megha Rai¹, Isabel Werle Noe¹, Damilola Raiyemo¹, Patrick Tranel¹; ¹University of Illinois (97)

† **Screening for multiple herbicide resistance in *Amaranthus* populations from Brazil.** Estefani Sulzbach*^{1,2}, Gabriel Machado Dias¹, Patrick Tranel², Catarine Markus¹; ¹Federal University of Rio Grande do Sul, ²University of Illinois (98)

† **Effect of Temperature on Degradation of Soil Residual Herbicides.** Estevan Cason*¹, Leonard Piveta¹, Julie M. Young¹, Thomas R. Butts¹, Bryan G. Young¹, William G. Johnson¹; ¹Purdue University (99)

† **Do Biostimulants Mitigate Herbicide Stress In Sorghum?** Lalit Mohan*¹, Sarah Lancaster¹, Tina Sullivan¹, Michael Duff²; ¹Kansas State University, ²Rosen's Inc (100)

Influence of Application Time of Day and Weed Size on Glufosinate Efficacy in a Problematic Waterhemp Population. Jessie R. Lewis*¹, Julie M. Young¹, Bryan G. Young¹; ¹Purdue University (101)

‡ **Response of Pigweed (*Amaranthus* spp.) Populations in Kansas to Glufosinate, Dicamba and 2,4-D.** Lucas Granzioli*^{1,2}, Igor Rezende Lima¹, Lalit Mohan¹, Sarah Lancaster¹, Joao Matheus Accetti^{1,2}, Victoria Johnson¹; ¹Kansas State University, ²State University of Maringa (102)

† **Turning Stress into Strength: Glyphosate Hormesis Enhances Growth and Water-Use Efficiency in Ivyleaf Morningglory.** Luka Milosevic*¹, Amit Jhala¹, Jon Scott¹, Stevan Knezevic¹; ¹University of Nebraska-Lincoln (103)

† **Dose-Response Characterization of Multiple Wisconsin Herbicide-Resistant *Amaranthus tuberculatus* Accessions.** Luma Lorena Loureiro da Silva Rodrigues*¹, Ahmadreza Mobli¹, Daniel Valadão Silva², Rodrigo Werle¹; ¹University of

NCWSS Program

Wisconsin-Madison, ²Federal Rural University of the Semi-Arid Region **(104)**

† **dnDsR: A high-throughput pipeline for calculating and analyzing evolutionary selection pressures between species.**

Nick Johnson*¹, Luan Cutti¹, Todd Gaines², Eric Patterson¹;
¹Michigan State University, ²Colorado State University **(105)**

† **Towards a Genome-Wide Association Study to Identify Genes Influencing S-metolachlor sensitivity in Waterhemp (*Amaranthus tuberculatus*).** Rishabh Singh*¹, Travis Wilke¹, Aaron Hager¹, Tiffany Jamann¹, Patrick Tranel¹; ¹University of Illinois **(106)**

† **Decoding the Evolutionary History of Sex Determining Regions in *Amaranthus* via Ancestral Reconstruction.**

Ramandeep Kaur*¹, Patrick Tranel¹; ¹University of Illinois **(107)**

† **Confirmation of Glyphosate-Resistant Common Lambsquarters (*Chenopodium album*), in Minnesota.** Adebisi Adeleke*¹, Thomas Peters², Eric Patterson³, Navjot Singh¹, Debalin Sarangi¹; ¹University of Minnesota, ²North Dakota State University, ³Michigan State University **(108)**

TUESDAY MORNING DECEMBER 16

General Session

LOCATION: Ambassador
TIME: 10:00 AM - 11:50 AM EST
CHAIR: Brett Miller
Syngenta Crop Protection

***SPEAKER**

- 10:00 AM Welcome to the 80th North Central Weed Science Society Annual Meeting.** Brett Miller*, Syngenta Crop Protection **(109)**
- 10:05 AM Positioning Agriculture for Success.** Tim Boring*, Director, Michigan Department of Agriculture & Rural Development **(110)**
- 10:30 AM A Classroom of American Democracy: Exploring the Gerald R. Ford Presidential Museum.** Mirelle Luecke*, Supervisory Curator, Gerald R. Ford Presidential Library & Museum **(111)**
- 10:45 AM Presidential Address.** Mark Bernards*; Rosen's Inc **(112)**
- 11:05 AM Washington, D.C., Science Policy Update.** Lee Van Wychen*; Weed Science Society of America **(113)**
- 11:25 AM NCWSS Finance Update.** Eric Spandl*; Winfield United **(114)**
- 11:35 AM Remembering NCWSS Members and Friends.** Zach Rystrom*; Midwest Research Inc **(115)**
- 11:45 AM Program Announcements.** Brett Miller*, Syngenta Crop Protection **(116)**
- 11:50 AM Adjourn**

TUESDAY AFTERNOON DECEMBER 16

Student Luncheon and Business Meeting

LOCATION: Pantlind
TIME: 12:00 PM - 1:15 PM
CHAIRS: Cristiana Rankrape
Southern Illinois University
Abigail Norsworthy
Purdue University

12:00 PM Student Luncheon

Sponsored by Corteva Agriscience – open to all graduate and undergraduate students

TUESDAY AFTERNOON DECEMBER 16

Student Contest – Row Crop Herbicide / Cover Crops & Integrated Weed Management

LOCATION: Ambassador East
TIME: 1:30 PM - 5:15 PM EST
CHAIR: Sachin Dhanda
South Dakota State University
TOPICS: Row Crop Herbicides
Cover Crops & IWM

***SPEAKER † GRADUATE CONTEST**

1:30 PM † Effect of Metribuzin and Sulfentrazone Rate and Combination on Waterhemp (*Amaranthus tuberculatus*) Control and Crop Safety Across Soil Types. Austin Weippert*¹, Joseph Ikley¹; ¹North Dakota State University **(117)**

1:45 PM † Novel Application of Root Analysis Software to Classify Soybean Line Sensitivity to Saflufenacil in Hydroponic Assay. Emma J. Lagerhausen*¹, Emerson L. Espinosa¹, Julie M. Young¹, Katy M. Rainey¹, Bryan G. Young¹; ¹Purdue University **(118)**

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- 2:00 PM** † **Herbicide Tank-Mix Concepts for Preemergence Waterhemp (*Amaranthus tuberculatus*) Control to Be Used in Future Soybean Technologies.** Carson Hought*¹, Joseph Ikley¹; ¹North Dakota State University **(119)**
- 2:15 PM** † **Investigating Delta-T Influence On Glufosinate Efficacy For Palmer Amaranth (*Amaranthus palmeri*) Control In Soybeans.** Lalit Mohan*¹, Sarah Lancaster¹, Jeremie Kouame¹, Victoria Johnson¹, Igor Lima¹; ¹Kansas State University **(120)**
- 2:30 PM** † **Exploring Weed Management Strategies for Short Stature Corn in Michigan.** Kyle Elizalde*¹, Erin Burns¹; ¹Michigan State University **(121)**
- 2:45 PM** † **Effect of Pre-Emerge Herbicide on Iron Deficiency Chlorosis Severity in Soybean on High pH Soils.** Jack Roehl*¹, Joseph Ikley¹; ¹North Dakota State University **(122)**
- 3:00 PM** † **How Variable Application Rates of Soil Residual Herbicides Alter Solution Availability in Nonuniform Field Soils.** Alexander R. Mueth*¹, Mearaj A. Shaikh¹, Joshua R. Widhalm¹, Siddhartho S. Paul¹, William G. Johnson¹, Bryan G. Young¹; ¹Purdue University **(123)**
- 3:15 PM** **Break**
- 3:30 PM** † **Influence of Glufosinate Application Timing, Rate, and Mixtures on Glufosinate-Resistant Soybean.** Anthony L. Perretta*¹, Leonard B. Piveta¹, Thomas R. Butts¹, Kevin W. Bradley², Ryan DeWerff³, Alyssa I. Essman⁴, Karla L. Gage⁵, Aaron G. Hager⁶, Joseph T. Ikley⁷, K. Badou-Jeremie Kouame⁸, Sarah H. Lancaster⁸, Travis R. Legleiter⁹, Eric J. Miller⁵, Thomas C. Mueller¹⁰, Jason K. Norsworthy¹¹, Christy L. Sprague¹², Lawrence E. Steckel¹⁰, Rodrigo Werle³, Julie M. Young¹, Bryan G. Young¹; ¹Purdue University, ²University of Missouri, ³University of Wisconsin-Madison, ⁴The Ohio State University, ⁵Southern Illinois University, ⁶University of Illinois, ⁷North Dakota State University, ⁸Kansas State University,

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⁹University of Kentucky, ¹⁰University of Tennessee, ¹¹University of Arkansas, ¹²Michigan State University (124)

- 3:45 PM † The Interaction of Diflufenican and Metribuzin on Soybean Response and *Amaranthus* Control.** Abigail N. Norsworthy*¹, Julie M. Young¹, Thomas R. Butts¹, Bryan G. Young¹; ¹Purdue University (125)
- 4:00 PM † Does the Absence of Atrazine Target-Site Resistance Reduce Concerns When Using Metribuzin to Control Problematic Indiana Waterhemp Populations?** Jessie R. Lewis*¹, Akanksha Singh¹, Julie M. Young¹, Patrick J. Tranel², Bryan G. Young¹; ¹Purdue University, ²University of Illinois (126)
- 4:15 PM † Accounting for pH and Salinity: A Deeper Look into Weed Seed Suppression with Black Soldier Fly Compost Tea.** Celia Corado*¹, Stephen Meyers¹, Laura Ingwell¹, Jeanine Arana¹, Nicolle Salamanca¹; ¹Purdue University (127)
- 4:30 PM † Residual Activity of Preemergence Herbicides for Weed Control in Corn and Soybean.** Tunde Akanbi*¹, Estefania Gomiero Polli¹, Alex Macvilay¹, Damian Franzenburg¹, Wesley Everman¹; ¹Iowa State University (128)
- 4:45 PM † Evaluating Cereal Rye Termination Timing, Nitrogen Application Timing, and Herbicide Programs in Corn Production.** Betsy Cunningham*¹, Alyssa Essman¹, Alexander Lindsey¹, Jim Ippolito¹, Anthony Dobbels¹, Colin Barclay¹; ¹The Ohio State University (129)
- 5:00 PM † Weed Control and Crop Safety of Winter Wheat Residual Herbicides Prior to Double-Crop Soybeans.** L. Joey Rains¹, Joaquin Enrria¹, J. Anita Dille¹; ¹Kansas State University (130)

TUESDAY AFTERNOON DECEMBER 16

**Student Contest - Weed Genetics & Herbicide
Physiology / Weed Biology & Ecology**

LOCATION: Ambassador West
TIME: 1:30 PM - 4:45 PM EST
CHAIRS: Isabel Werle Noe
University of Illinois

TOPICS: Weed Genetics & Herbicide Physiology
Weed Biology & Ecology

***SPEAKER † GRADUATE CONTEST**

1:30 PM † Harnessing Big Data from Model Species for Cis-Regulatory Annotation in Non-Model Plants via Transfer Learning. Nick Johnson*¹, Daniel Filho¹, Michael Bernhofer², Emir Islamovic², Brent Murphy², Eric Patterson¹; ¹Michigan State University ²BASF **(131)**

1:45 PM † What Is the Impact of a Changing Climate on the Geographic Distribution of Giant Ragweed? Datta Chiruvelli*¹, Ryan Briscoe Runquist¹, David Moeller¹, Roger Becker¹, Amit Jhala², Debalin Sarangi¹; ¹University of Minnesota, ²University of Nebraska-Lincoln **(132)**

2:00 PM † Identification of a Novel Clopyralid Detoxification Pathway in Clopyralid Resistant Ragweed (*Ambrosia artemisiifolia*). Michael Ozolins*¹, Erin Hill¹, Erin Burns¹, Eric Patterson¹; ¹Michigan State University **(133)**

2:15 PM † Defining the Critical Period for Waterhemp Seedbank Management. Navjot Singh*¹, Roger L. Becker¹, Gregg A. Johnson¹, Franck E. Dayan², Debalin Sarangi¹; ¹University of Minnesota, ²Colorado State University **(134)**

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- 2:30 PM † Confirmation and Transcriptomic Characterization of Glufosinate-ammonium Resistance in Waterhemp (*Amaranthus tuberculatus*) Populations from Illinois.** Cristiana Bernardi Rankrape*¹, Isabel Werle Noe², Logan Miller², Eduardo Lago¹, Rishabh Singh², Alexander Lopez², Aaron Hager², Karla Gage¹, Patrick Tranel²; ¹Southern Illinois University, ²University of Illinois **(135)**
- 2:45 PM † Weed Seed Survival and Germination in Simulated Chaff Lines.** Amber Emmons*¹, Mercy Odemba¹, Daniel Doretto¹, Tony Dobbels¹, Colin Barclay¹, Ram Yadav¹, Alyssa Essman¹, Eugene Law¹; ¹The Ohio State University **(136)**
- 3:00 PM † Development of KASP Assays to Differentiate between *Sorghum bicolor*, *halepense*, and their Hybrids: Insight into Crop-to-Weed Gene Flow.** Connor Purvis*¹, Eric Patterson¹, Erin Burns¹; ¹Michigan State University **(137)**
- 3:15 PM Break (30 min)**
- 3:45 PM † Confirming Group 15 Herbicide Resistance in a Giant foxtail (*Setaria faberi*) Population.** Aaron Hager¹, Caleb Wepprecht*¹; ¹University of Illinois **(138)**
- 4:00 PM † Expression of HPPD and CYP genes in Triketone- Resistant Transgenic Wheat.** Akshitha Reddy Bynegeri*¹, Susee Sudhakar², Yaiphabi Kumam³, Veerendra Sharma⁴, Harold N. Trick¹, Vara Prasad PV¹, Mithila Jugulam⁵; ¹Kansas State University, ²University of Arkansas, ³University of Florida, ⁴Oregon State University, ⁵Texas A&M University **(139)**
- 4:15 PM † Validation of Agar-Based Dose-Response Assays for Herbicide Resistance Confirmation in *Amaranthus tuberculatus*.** Luma Lorena Loureiro da Silva Rodrigues*¹, Alice Lazzari¹, Livia Venturi¹, Sabeel Abuhakmeh¹, Daniel Valadão Silva², Ahmadreza Mobli¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison, ²Federal Rural University of the Semi-Arid Region **(140)**

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- 4:30 PM † Using a Chlorophyll Fluorescence-Based Leaf-Disk Assay to Characterize the Bioavailability and Release Patterns of Encapsulated Saflufenacil.**
Jada N. Davis*¹, Julie M. Young¹, Thomas R. Butts¹, Bryan G. Young¹; ¹Purdue University **(141)**

TUESDAY AFTERNOON DECEMBER 16

Student Contest - Horticulture & Specialty Crops / Equipment & Application Technology / Cover Crops & Integrated Weed Management

LOCATION:	Vandenburg A
TIME:	1:30 PM - 5:00 PM EST
CHAIRS:	Angela Kazmierczak <i>Bayer Crop Science</i>
TOPICS:	Horticulture & Specialty Crops Equipment & Application Tech. Cover Crops & IWM

***SPEAKER † GRADUATE CONTEST**

- 1:30 PM † Evaluating Herbicide Options for Kernza® (*Thinopyrum intermedium*).** Adebisi Adeleke*¹, Isidor Ceperkovic¹, Katherine Bohn¹, Jesse Bealsburg¹, Jacob Jungers¹, Debalin Sarangi¹; ¹University of Minnesota **(142)**
- 1:45 PM † Does Cereal Rye and Reduced Tillage Influence Weed Management in Dry Edible Beans?** Jacob H. Felsman*¹, Brian J. Stiles II¹, Christy L. Sprague¹; ¹Michigan State University **(143)**
- 2:00 PM † Tolerance of Newly Planted Peppermint (*Mentha x piperita*) to Ethofumesate Under Greenhouse Conditions.** Nicolle Salamanca*¹, Stephen Meyers¹, Celia Corado¹, Jeanine Arana¹, Helen Nocito¹; ¹Purdue University **(144)**

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- 2:15 PM † Influence of Tillage System and Herbicide Programs for Weed Control in Truvera Sugarbeet.** Michael Dodde*¹, Christy Sprague¹; ¹Michigan State University (145)
- 2:30 PM † Fall Herbicide Applications in Winter Wheat: Does Planting Date Matter?** Kaddi Gewirtz*¹, Christy Sprague¹; ¹Michigan State University (146)
- 2:45 PM † Response of Popcorn and Processing Sweet Corn Hybrids to a Pre-Mix of Saflufenacil and Pyroxasulfone (Surtain®) Applied Pre- and Early Post-Emergence.** Ankit Yadav*¹, John Frihauf², Amit Jhala¹; ¹University of Nebraska-Lincoln, NE, ²BASF (147)
- 3:00 PM † Use Case for Ultra Precision Targeted Herbicide Applications in Wisconsin Non-GMO Corn and Soybean Cropping Systems.** Daniel Zhu*¹, Guilherme Alves¹, Sabeel Abuhakmeh¹, Ryan DeWerff¹, Zaim Ugljic¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison (148)
- 3:15 PM Break**
- 3:30 PM † Targeted, Broadcast, or Both? On-Farm Evaluation of Herbicide Application Strategies in Soybean.** Igor Rezende Lima*¹, Sarah Lancaster¹, Lalit Mohan¹, Salina Raila^{1,2}, Yasir Parrey¹, Lucas Freitas Granzioli^{1,3}, Joao M. Stempniak Accetti^{1,3}, Landon Duff¹; ¹Kansas State University, ²University of Manitoba, ³State University of Maringa (149)
- 3:45 PM † Critical Time for Cereal Rye Termination: Balancing Weed Suppression and Soybean Yield in Planting Green Systems.** Guilherme Chudzik*¹, Jose Nunes², Karla Gage³, Sarah Lancaster⁴, Travis Legleiter⁵, Joe Ikley⁶, Jason Norsworthy⁷, Alyssa Essman⁸, Christy Sprague⁹, Vipin Kumar¹⁰, Kevin Bradley¹¹, William Johnson¹², Bryan Young¹², Ryan DeWerff¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison, ²Syngenta Crop Protection, ³Southern Illinois University, ⁴Kansas State University, ⁵University of Kentucky, ⁶North Dakota State University, ⁷University of Arkansas, ⁸The Ohio State University, ⁹Michigan State University,

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¹⁰University of Nebraska-Lincoln, ¹¹University of Missouri, ¹²Purdue University (150)

- 4:00 PM † What We Learned from Multiyear Wisconsin Research on Glufosinate Tank Mixes and Application Methods.** Nikola Arsenijevic*¹, Ahmadreza Mobli¹, Ryan Dewerff¹, Zaim Ugljic¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison (151)
- 4:15 PM † Integrating Early Spring-planted Barley or Oat with Herbicides for *Palmer amaranth* Management in Soybean.** Vipin Kumar*¹, Humberto Blanco-Canqui¹, Amit Jhala¹, Samuel Wortman¹, Saleh Taghvaeian¹; ¹University of Nebraska-Lincoln (152)
- 4:30 PM † Beyond the Boots: A practical Guide to Using Drones for Efficient Herbicide Injury Scouting.** Emmanuel G Cooper*¹, Maria Carolina CR Souza¹, Leonard B Piveta¹, Bryan G Young¹, Julie M Young¹, Thomas R Butts¹; ¹Purdue University (153)
- 4:45 PM † Burcucumber (*Sicyos angulatus*) Management in Corn.** Maria Carolina CR Souza*¹, Estevan G Cason¹, Emmanuel G Cooper¹, Anthony L Perretta¹, Leonard B Piveta¹, Adam C Shanks¹, Julie M Young¹, Bryan G Young¹, Thomas R Butts¹; ¹Purdue University (154)

TUESDAY AFTERNOON DECEMBER 16

Student Extension Video Contest

LOCATION: Vandenburg B
TIME: 3:30 PM - 4:30 PM EST
CHAIR: Meaghan Anderson
Iowa State University

***SPEAKER † STUDENT CONTEST**

NCWSS Program

- 3:30 PM † Practical Weed Management for Small Farms.** Celia Corado*¹, Stephen Meyers¹, Jeanine Arana¹, Nicolle Salamanca¹; ¹Purdue University **(155)**
- 3:36 PM † Investigating the Influence of Incorporation Depth on Preemergence Weed Control.** João Matheus Stempniak Accetti*^{1, 2}, Sarah Lancaster¹, Victoria Johnson¹, Lucas Granzioli^{1, 2}, Gary Lynn Justesen³; ¹Kansas State University, ²State University of Maringa, ³UPL NA Corporation Ltd **(156)**
- 3:42 PM † Scouting Italian Ryegrass: When and Where to Look.** Abby Connor*¹, Disha Ande¹, Travis Legleiter¹; ¹University of Kentucky **(157)**
- 3:48 PM † Volunteer Wheat Management to Reduce Wheat Streak Mosaic Virus.** Lucas Granzioli*^{1, 2}, Sarah Lancaster², Victoria Johnson², Joao Matheus Accetti^{1, 2}, Kelsey Anderson Onofre²; ¹State University of Maringa, ²Kansas State University **(158)**
- 3:54 PM † The Life of Ryegrass: Why Timing Matters.** Disha Ande*¹, Abby Connor¹, Travis Legleiter¹; ¹University of Kentucky **(159)**
- 4:00 PM † Planting Green: Corn in Cereal Rye.** Ankit Yadav*¹, Vipin Kumar¹, Amit Jhala¹; ¹University of Nebraska-Lincoln **(160)**
- 4:06 PM † Targeted Spraying Technologies: How They Work and Why They Matter.** Zaim Ugljic*¹, Nikola Arsenijevic¹, Aaron Hunsinger², Rodrigo Werle¹; ¹University of Wisconsin-Madison, ²Bosch BASF Smart Farming - One Smart Spray **(161)**
- 4:12 PM † Tank-Mix Failures: How to Avoid Common Mistakes.** Grant D. Isaacs*¹, Abigail N. Norsworthy¹, Bryan G. Young¹; ¹Purdue University **(162)**
- 4:18 PM † Managing Strawberry Runners with Napropamide.** Jeanine Arana*¹, Stephen Meyers¹, Celia Corado¹, Nicolle Salamanca¹, Helen Nocito¹; ¹Purdue University **(163)**

WEDNESDAY MORNING DECEMBER 17

**POSTER SESSION 2 – NON-STUDENT
CONTEST POSTERS**

LOCATION: Center Concourse
TIME: 7:00 AM - 8:30 AM EST

All presenting authors not in student poster contest are to be at poster on Wednesday, December 17, 7:00-8:30 AM

WEDNESDAY MORNING DECEMBER 17

***Symposium – The Impact & Future for
Biologicals as Agrochemical Management
Practices & Solutions***

LOCATION: Imperial
TIME: 8:30 AM - 10:50 AM EST
CHAIR: Scott Tann
Lamberti

***SPEAKER**

- 8:30 AM** **How Did We Get Here and Where Are We Headed? A Review of Biological Pest Control Agents in the Market and a Look to the Future.**
Pam Marrone*¹; ¹Invasive Species Corporation
(164)
- 9:30 AM** **Biopesticides in Use Today and Into the Future.**
Jonathan Huff*¹; ¹Corteva AgriScience (165)
- 9:50 AM** **Bio-efficacy Enhancers Used Today and Into the Future.** Adam Monroe¹; ¹Zymtronix (166)
- 10:10 AM** **Bio-based Adjuvants in Use Today and Into the Future.** Matthew Faletti*¹; ¹Precision Laboratories, Inc (167)
- 10:30 AM** **Panel Discussion and Q&A (168)**

WEDNESDAY MORNING DECEMBER 17

Rangeland, Pasture & Vegetative Weed Management

LOCATION: Imperial
TIME: 11:00 AM - 11:45 AM EST
CHAIR: Eric Jones
South Dakota State University

***SPEAKER**

- 11:00 AM Does surfactant type influence herbicide control of wintercreeper (*Euonymus fortunei*). George Oganda¹, Reid Smeda*¹; ¹University of Missouri (169)**
- 11:15 AM Effect of 2,4-D followed by wiper-applied glyphosate on leafy spurge (*Euphorbia esula*). Eric Jones*¹, Jill Alms¹, David Vos¹; ¹South Dakota State University (170)**
- 11:30 AM Business Meeting – Rangeland, Pasture & Vegetative Weed Management**

WEDNESDAY MORNING DECEMBER 17

Extension Section and Symposium – What’s New in Extension

LOCATION: Vandenburg A
TIME: 8:30 PM – 11:45 AM EST
CHAIR: Marcelo Zimmer
Purdue University

***SPEAKER**

- 8:30 AM Identifying and mitigating the concerns around the ESA Herbicide Strategy in Iowa. Wesley Everman*¹, Ruoyu Wang¹, Katie Dentzman¹, David Hennessy¹; ¹Iowa State University (171)**

NCWSS Program

- 8:45 AM** **Corn and Soybean Herbicide Performance on Common Ragweed Resistant to Groups 2, 9, and 14 Herbicides.** Joseph Ikley*¹, Austin Weippert¹; ¹North Dakota State University (172)
- 9:00 AM** **Pyridate as a PSII Alternative for Corn Weed Management Systems.** Grant D. Isaacs*¹, Thomas R. Butts¹, Bryan G. Young¹; ¹Purdue University (173)
- 9:15 AM** **From Combines to Cover Crops: Statewide Extension Efforts to Promote Integrated Weed Management in Wisconsin.** Daniel Smith*¹, Ryan DeWerff¹, Amadreja Mobli¹, Rodrigo Werle¹; ¹University of Wisconsin-Madison (174)
- 9:30 AM** **Business Meeting – Extension**
- 9:45 AM** **Break**

Symposium – What’s New in Extension

- 10:00 AM** **Data Dumps and Decision Support: Applying AI (Augmented Intelligence) in Extension.** J. Mark Locklear¹; ¹Extension Foundation (175)
- 10:50 AM** **Name That in a Snap with an App: A Review of Plant Identification Technologies.** Erin Hill*¹; ¹Michigan State University (176)
- 11:05 AM** **The Extension Connection: How Farmers and Ag Professionals Really Want to Receive Information.** David Nicolai*¹, Seth Naeve¹, Kristina Cibuzar¹; ¹University of Minnesota (177)
- 11:20 AM** **Capturing Stakeholder Perspectives in Weed Science: Implications for Extension Programming and Graduate Training.** Rodrigo Werle*¹, Guilherme Chudzik¹, Zaim Ugljic¹, Nikola Arsenijevic¹; ¹University of Wisconsin – Madison (178)

WEDNESDAY MORNING DECEMBER 17

Row Crop Herbicides

LOCATION: Governors
TIME: 9:15 AM - 11:45 AM EST
CHAIR: Vipin Kumar
University of Nebraska-Lincoln

***SPEAKER**

- 9:15 AM Sonic Boom: A New Corteva Soybean PRE Herbicide.** Spencer Samuelson*¹, Kelly Backscheider¹, Lowell Sandell¹, Kristin Rosenbaum¹, Lucas Oliveira Ribeiro Maia¹, Kevin Johnson¹; ¹Corteva Agriscience **(179)**
- 9:30 AM Vyconic Soybeans: A Flexible Approach to Preemergent Weed Management with Acetochlor-Mesotrione Premix.** Katilyn Price*¹, Carl Coburn¹, Zewei Miao¹, Emily Scholting¹; ¹Bayer Crop Science **(180)**
- 9:45 AM Break**
- 10:00 AM Convintro™ Herbicide: A New Tool for Managing *Amaranthus* Species in Corn and Soybean.** Jody Gander*¹, Katilyn Price¹, Carl Coburn¹, Zewei Miao¹, Emily Scholting¹; ¹Bayer Crop Science **(181)**
- 10:15 AM Utilization of metribuzin for waterhemp (*Amaranthus tuberculatus*) management in corn.** Eric Jones*¹, Jill Alms¹, David Vos¹, Tommy Butts², Leonard Piveta², Alyssa Essman³, Anthony Dobbels³, Wesley Everman⁴, Damian Frazenburg⁴, Alex Macvilay⁴, Aaron Hager⁵, Joseph Ikley⁶, Rodrigo Werle⁷, Ryan DeWerff⁷; ¹South Dakota State University, ²Purdue University, ³Ohio State University, ⁴Iowa State University, ⁵University of Illinois, ⁶North Dakota State University, ⁷University of Wisconsin-Madison **(182)**

NCWSS Program

- 10:30 AM Weed control efficacy and crop safety of Interline® Mega (Glufosinate-P) herbicide programs in glufosinate-tolerant soybean.** Ryan Bryant-Schlobohm*¹, Ryan Henry¹, Matthew Jenkins¹, Kathryn Ruddy¹, Cody Gray¹; ¹UPL NA, Inc (183)
- 10:45 AM Optimized Herbicide Solutions for Effective Control of Multiple Herbicide Resistant *Amaranthus*.** Scott Cully*¹, David Belles¹, Mark Kitt¹, Jesse Haarmann¹, Tom Beckett¹; ¹Syngenta Crop Protection (184)
- 11:00 AM Epyrifenacil (Rapidil®) Tank-Mixes for Cover Crop Termination (Cereal Rye and Wheat) in No-Till Soybean and Corn Production.** Eric Ott*¹, Garrison Gundy¹, Chad Smith¹, Sam Noe¹, Nathan Drewitz¹, Pat Clay¹; ¹Valent USA LLC (185)
- 11:15 PM Epyrifenacil (Rapidil®) Programs for Burndown Weed Control in No-Till Corn, Soybeans, and Wheat.** Chad Smith*¹, Garrison Gundy¹, Eric Ott¹, Sam Noe¹, Nathan Drewitz¹, Pat Clay¹; ¹Valent USA LLC (186)
- 11:30 AM Business Meeting - Row Crop Herbicide**

WEDNESDAY MORNING DECEMBER 17

Weed Genetics & Herbicide Physiology / Weed Biology & Ecology

LOCATION: Vandenburg B
TIME: 8:45 AM - 11:45 AM EST
CHAIRS: Jesse Haarmann
Syngenta Crop Protection

***SPEAKER**

- 8:45 AM Herbicide Resistance Linked to a New PPO2 Mutation in Michigan Populations of *Ambrosia artemisiifolia*.** Sara Alvarez Rodriguez*¹, Michael Ozolins¹, Aimone Porri², Eric Patterson¹;
¹Michigan State University, ²BASF SE (187)

NCWSS Program

- 9:00 AM** **A rearranged *Amaranthus palmeri* extrachromosomal circular DNA confers resistance to glyphosate and glufosinate.** Eric Patterson*¹, Pamela Carvalho-Moore², Ednaldo Borgato¹, Luan Cutti³, Aimone Porri⁴, Ingo Meiners⁴, Jens Lerchl⁴, Jason Norsworthy²; ¹Michigan State University, ²University of Arkansas, ³Corteva Agriscience, ⁴BASF **(188)**
- 9:15 AM** **Distinct and Shared Gene Expression Signatures Induced by 2,4-D, Dicamba and Glyphosate Herbicides in Non-GMO Soybean.** Akanksha Singh*¹, Julie Young¹, Bryan Young¹; ¹Purdue University **(189)**
- 9:30 AM** **Reduced Mesotrione Metabolism Enhances Grain Sorghum Injury under High Temperature Stress.** Yasir Parrey*¹, PV Vara Prasad¹, Mithila Jugulam²; ¹Kansas State University, ²Texas A&M University **(190)**
- 9:45 AM** **Break**
- 10:00 AM** **Environmental by Genotypic Drivers of *Parthenium hysterophorus* Photosynthesis and Phenotypic Plasticity.** Sarah Kezar*¹, Akhilesh Sharma², Magdalena Julkowska², Tim Setter², Antonio DiTommaso²; ¹University of Wisconsin, ²Cornell University **(191)**
- 10:30 AM** **Environmental and Genetic Factors Shaping Seasonal Life Cycle Type in Horseweed (*Erigeron canadensis*).** Robin Waterman*¹, Brooke Catlett^{1, 2}, Ishwari Bhatt^{1, 3}, Georgia Edmonds^{1, 3}, Jeffrey K. Conner¹; ¹Michigan State University, ²Southern Illinois University, ³Kalamazoo Area Mathematics and Science Center **(193)**
- 10:45 PM** **Comparative Performance of Conventional and Short-Stature Corn Hybrids in Wisconsin: Canopy Development, Weed Suppression, and Yield.** Ahmadreza Mobli*¹, Harkirat kaur¹, Ryan Dewerff¹, Luma Lorena Loureiro Da Silva Rodrigues¹, Daniel Qiran Zhu¹, Rodrigo Werle¹; ¹University of Wisconsin- Madison **(194)**

NCWSS Program

- 11:00 AM** **Evaluating the Evolutionary Stability of Dioecy in the Genus *Amaranthus*.** Alexander Lopez*¹, Lucas Bobadilla¹, Damilola Raiyemo¹, Isabel Werle¹, Patrick Tranel¹; ¹University of Illinois (195)
- 11:15 PM** **Waterhemp Management in Early Planted Soybean- What We've Learned the Past Five Years.** Aaron Hager¹, Logan Miller*¹; ¹University of Illinois (196)
- 11:30 AM** **Business Meeting – Weed Genetics & Herbicide Physiology / Weed Ecology & Biology**

WEDNESDAY NOON DECEMBER 17

Society Awards Luncheon

LOCATION: Ambassador
TIME: 12:00 PM - 1:15 PM

WEDNESDAY AFTERNOON DECEMBER 17

**Graduate Student Symposium – Building Your
Future: Career Development & Interview
Strategies**

LOCATION: Imperial
TIME: 1:30 PM - 5:00 PM EST
CHAIRS: Cristiana Rankrape
Southern Illinois University
Abigail Norsworthy
Purdue University

***SPEAKER**

- 1:30 PM Introduction.** Cristiana Rankrape*¹, Abigail Norsworthy*²; ¹Southern Illinois University, Carbondale, IL, ²Purdue University **(197)**
- 1:35 PM Building an Academic Program that Lasts.** Bryan Young*¹, Thomas Butts¹; ¹Purdue University **(198)**
- 1:50 PM Extension 101: Building Trust, Relevance, and Reach.** Rodrigo Werle*¹; ¹University of Wisconsin-Madison **(199)**
- 2:05 PM Making the Leap from Graduate School to Industry.** Samuel Noe*¹; ¹Valent USA **(200)**
- 2:20 PM Advocating for Weed Science in D.C.** Lee Van Wychen*¹; ¹Weed Science Society of America **(201)**
- 2:35 PM Unlocking Opportunity: Strategies to Get Noticed, Get Hired.** Dawn Refsell*¹; ¹Corteva Agriscience **(202)**
- 2:50 PM Inside Academia: What to Expect in a Faculty Job Interview.** Sarah Lancaster*¹; ¹Kansas State University **(203)**
- 3:05 PM Speaker Panel and Q&A (204)**
- 3:15 PM Break**

NCWSS Program

3:30 PM **Mock Interviews (205)**

Moderated by Karla Gage¹ and Dawn Refsell²

Nick Steppig*³

Livia Ianhez Pereira*⁴

Jose Nunes*⁵

Mathew Jenkins*⁶

Ryan Edwards*⁷

¹Southern Illinois University, ²Corteva Agriscience,

³BASF, ⁴Bayer Crop Science, ⁵Syngenta Crop

Protection, ⁶UPL, ⁷Winfield United

WEDNESDAY AFTERNOON DECEMBER 17

Symposium - The Drone Revolution in Weed Science: Market, Science, and Retail

LOCATION: Governors
TIME: 1:30 PM - 5:00 PM EST
CHAIRS: Ryan Edwards
Winfield United
Fritz Koppatschek
ABG Ag Services

***SPEAKER**

- 1:30 PM Fundamentals of Drone Sprays for Weed Scientists.** Mark Ledebuhr*¹; ¹Application Insight, LLC (206)
- 2:00 PM Drone Speed Dating - A Summary of Four Years of Research.** Jason Deveau*¹; ¹Ontario Ministry of Agriculture, Food and Agribusiness (207)
- 2:15 PM Drones: Finding their Fit on the Farm.** John Scott*¹; ¹Keystone Cooperative (208)
- 2:30 PM Understanding Federal Regulations for Spray Drones.** Alex Ryan*¹; ¹Agrispray Drones (209)
- 2:45 PM Laboratory Method Development, Challenges, and Open Questions in Drone Spray Measurements.** Steven Fredericks*¹, Matthew Rogers¹, Sawyer Massie¹; ¹Winfield United (210)

NCWSS Program

- 3:00 PM Drone Applications- The Good, The Bad, and The Ugly.** Dean Grossnickle*¹, Neill Newton¹, Blake Patton², Phil Krieg¹, Scott Cully¹; ¹Syngenta Crop Protection, ²Rend Lake College **(211)**
- 3:15 PM Break**
- 3:30 PM Will Spray Drones Work for Herbicide Applications? Well, the Weeds are Dead.** Bryan Young*¹, Hunter Medenwald¹, Julie Young¹, Thomas Butts¹; ¹Purdue University **(212)**
- 3:45 PM Capabilities and Viability of Drones in Our Weed Science World.** Thomas Butts*¹, Maria Souza¹, Emmanuel Cooper¹, Cason Estevan¹, Leo Piveta¹, Julie Young¹, Bryan Young¹; ¹Purdue University **(213)**
- 4:15 PM 20X Faster Drone Imaging for Full Field Weed Detection and Classification.** Todd Colten*¹; ¹Senterra / John Deere **(214)**
- 4:30 PM Aerial Imagery: Automated & Elevated Analytics for Field Research.** Jeremiah Roeth*¹; ¹AerialPLOT **(215)**

WEDNESDAY AFTERNOON DECEMBER 17

Horticulture & Specialty Crops

LOCATION: Vandenburg A
TIME: 1:30 PM – 4:15 PM EST
CHAIR: Reid Smeda
University of Missouri

***SPEAKER**

- 1:30 PM Golden Pennycress Response to PRE, POST and Desiccant Herbicides.** Mark Bernards*¹, Carrie Eberle², Ryan DeWerff³, Ahmadreza Mobli³, Rodrigo Werle³; ¹Rosens, Inc., ²USDA-ARS, ³University of Wisconsin-Madison **(216)**

NCWSS Program

- 1:45 PM Integrating Bioherbicides into Palmer amaranth (*Amaranthus palmeri* S. Watson) Control Strategies.** Milan Brankov*¹, Breno Rodrigues², Jeffrey Golus², Kasey Schroeder², Milos Zanic²; ¹Maize Research Institute, ²University of Nebraska-Lincoln WCREEC **(217)**
- 2:00 PM Icafolin-Methyl - a New Molecule in the Chemical Class (Isoxazolin-Carboxamides) from Bayer CropScience.** Angela Kazmierczak*¹, Christopher Mansiere¹, Allan Kaastra¹, Lothar Lorentz¹; ¹Bayer CropScience **(218)**
- 2:15 PM Evaluating Flumioxazin Applications to Red and Chipping Potato Cultivars.** Harlene Hatterman-Valenti*¹, Collin Auwarter¹; ¹North Dakota State University **(219)**
- 2:30 PM Sugarbeet Tolerance from Herbicide Mixtures with Insecticides and Fungicides.** Adam Aberle*¹, Thomas Peters¹, David Mettler², Emma Burt³; ¹North Dakota State University, ²Southern Minnesota Beet Sugar Cooperative, ³Minn-Dak Farmers Cooperative **(220)**
- 2:45 PM IR-4 Weed Science Update - Food Crops.** Roger B. Batts*¹; ¹IR-4 Project **(221)**
- 3:00 PM Evaluation of Bromoxynil Mixtures Applied with Graminicides in Wheat.** Daniel Beran*¹, Joe Vassios¹; ¹Nufarm Americas Inc **(222)**
- 3:15 PM Break**
- 3:30 PM PPI, PRE, and POST Options for Common Ragweed Control in Drybean.** Joseph Ikley¹, Charlie Lim*¹, Austin Weippert¹, Carson Hought¹, Jack Roehl¹, Jenna Larson¹, Glenn Nice¹; ¹North Dakota State University **(223)**
- 3:45 PM Talinor: Earlier Applications for More Flexible Weed Control.** Nathan Haugrud*¹, Marty Schraer¹, Ben Westrich¹, Dan Wilkinson¹, Pratap Devkota¹, Tom Beckett¹, David Belles¹; ¹Syngenta Crop Protection **(224)**

NCWSS Program

4:00 PM Business Meeting – Horticulture & Specialty Crops

WEDNESDAY AFTERNOON DECEMBER 17

Equipment & Application Technology / Cover Crops & Integrated Weed Management

LOCATION: Vandenburg B
TIME: 1:30 PM – 4:30 PM EST
CHAIR: John Brewer
Syngenta Crop Protection

***SPEAKER**

- 1:30 PM Deposition Assessment of Asymmetric Fan Nozzles under Uniform and Alternate Arrangements.** Laurel Daily¹, Rasmita Mainali¹, Breno Rodrigues¹, Jeffrey Golus¹, Milos Zaric^{*1}; ¹University of Nebraska-Lincoln WCREEC (225)
- 1:45 PM Maximizing POST Herbicide Savings: The Role of PRE Herbicide Programs in Targeted Application Systems.** Zaim Ugljic^{*1}, Ryan Dewerff¹, Jeff Laufenberg², Jose Nunes², Aaron Hunsinger³, Rodrigo Werle¹; ¹University of Wisconsin-Madison, ²Syngenta Crop Protection, ³Bosch BASF Smart Farming (226)
- 2:15 PM Overlapping Residual Programs in Early Planted Soybean.** Estevan Cason^{*1}, Emmanuel G Cooper¹, Maria Carolina CR Souza¹, Leonard Piveta¹, Julie M. Young¹, Thomas R. Butts¹, Bryan G. Young¹, William G. Johnson¹; ¹Purdue University (228)
- 2:30 PM Flame Weeding in Soybean: Crop Tolerance Confirmed During Flowering Stage.** Luka Milosevic^{*1}, Amit Jhala¹, Jon Scott¹, Stevan Knezevic¹; ¹University of Nebraska-Lincoln (229)
- 2:45 PM Influence of Long-term Cover Crop on Weed Density and Seedbank Communities in Soybean-Corn Cropping Systems in Iowa.** Estefania Polli^{*1}, Alex McValey¹, Damian Franzenburg¹, Tunde

NCWSS Program

Akanbi¹, Maynard Ceballos Feliz¹, Wesley Everman¹; ¹Iowa State University (230)

- 3:00 PM Temperature Effects on Postemergence Herbicide Efficacy for Controlling Large Crabgrass (*Digitaria sanguinalis*) in Ornamental Production.** Supti Saha Mou*¹, Debalina Saha¹; ¹Michigan State University (231)
- 3:15 PM Break**
- 3:30 PM Cereal Rye Cover Crop for Weed Suppression in Corn-Soybean Systems: Wisconsin Research Lessons.** Rodrigo Werle*¹, Kolby Grint², Victor Ribeiro³, Tatiane Severo Silva¹, Jose Junior Nunes⁴, Guilherme Chudzik¹, Jacob Felsman⁵, Livia Venturi¹, Alice Lazzari¹, Nicholas Arneson⁶, Ryan DeWerff¹, Daniel Smith¹, Nikola Arsenijevic¹, Ahmadreza Mobli¹; ¹University of Wisconsin-Madison, ²USDA NRCS, ³Oregon State University, ⁴Syngenta Crop Protection, ⁵Michigan State University, ⁶The Nature Conservancy (232)
- 3:45 PM Wisconsin Insights from 2025 Research on Targeted Herbicide Application Technologies.** Rodrigo Werle*¹, Zaim Ugljic¹, Daniel Zhu¹, Guilherme Sousa Alves¹; ¹University of Wisconsin-Madison (233)
- 4:00 PM The Utility of Glufosinate for Weed Management in the Central Great Plains.** Philip Westra*¹, ¹Colorado State University (234)
- 4:15 PM Business Meeting – Herbicide Application Technologies / Cover Crops & Integrated Weed Management**

WEDNESDAY EVENING DECEMBER 17

Society Social

Sponsored by the Sustaining Members – Open to all attendees

LOCATION: Pantlind

TIME: 5:30 PM – 7:00 PM EST

THURSDAY MORNING DECEMBER 18

**Society Breakfast, Student Contest Awards and
What's New in Industry Symposium**

LOCATION: Ambassador
TIME: 7:00 AM - 10:00 AM EST
MODERATOR: Seth Strom
Syngenta Crop Protection

***SPEAKER**

- 7:00 AM Meal Served (Preregistration required)**
- 7:30 AM Keynote Address.** Corey Guza*; Michigan Sugar Company, Bay City, MI **(235)**
- 8:15 AM Student Contest Awards**
Adam Striegel, *Bayer Crop Science*
Nicholas Steppig, *BASF*
Joe Ikley, *North Dakota State University*
- 8:45 AM Industry Updates.** Sustaining Member Company representatives* **(236)**
- 10:00 AM Industry Business Meeting**

NCWSS Recognitions

2025 Officers/Executive Committee

President

Mark Bernards Rosens, Inc
mbernards@riw2000.com

President-Elect

Brett Miller Syngenta
brett.miller@syngenta.com

Vice-President

Fritz Koppatschek ABG Ag Services
fkoppatschek@abgagservices.com

Past President

Dawn Refsell Corteva Agriscience
dawn.refsell@corteva.com

Secretary/Treasurer

Eric Spandl WinField United
epspandl@landolakes.com

Editor, NCWSS Proceedings

Karla Gage Southern Illinois University
kgage@siu.edu

Editor, NCWSS Communications

Travis Legleiter University of Kentucky
travis.legleiter@uky.edu

WSSA Representative

Erin Burns Michigan State University
burnser5@msu.edu

CAST Representative

Tom Peters North Dakota State University
thomas.j.peters@ndsu.edu

Executive Secretary

Eric Gustafson Interactive Management, Inc.
info@ncwss.org

NCWSS Recognitions

Directors at Large

Extension	Marcelo Zimmer zimmer6@purdue.edu
Graduate Students	Cristiana Rankrape cris.rankrape@siu.edu
Industry	Seth Strom seth.strom@syngenta.com
Resident Education	Adam Striegel adam.striegel@bayer.com
Strategic Planning	Angela Kazmierczak angela.kazmierczak@bayer.com
Eastern	Steve Meyers (2027) slmeyers@purdue.edu
Central	Chad Smith (2027) chad.smith@valent.com
Western	Tate Castillo (2025) Tate.castillo@bayer.com

NCWSS Interest Group Committees

Extension

Marcelo Zimmer, Chair	zimmer6@purdue.edu
Meaghan Anderson, Vice Chair	mjanders@iastate.edu

Graduate Student Committee

Cristiana Rankrape, Chair	cris.rankrape@siu.edu
Abigail Norsworthy, Vice- chair	anorswo@purdue.edu

Industry

Seth Strom, Chair	seth.strom@syngenta.com
Mike Probst, Vice Chair	Michael.probst@basf.com

Resident Education

Adam Striegel, Chair	adam.striegel@bayer.com
Nicholas Steppig, Vice-chair	nicholas.steppig@basf.com
Joe Ikley, 2 nd Vice-chair	joseph.ikley@ndsu.edu

Summer Contest Subcommittee

Adam Striegel, Chair	adam.striegel@bayer.com
Nicholas Steppig, Vice-chair	nicholas.steppig@basf.com
Troy Klingman, Host	klingatd@basf.com

NCWSS Section Program Chairs

General Program

Brett Miller, Chair	brett.miller@syngenta.com
Christy Sprague, LAC	sprague1@msu.edu

Student Awards, Resident Education

Adam Striegel, Grad Student Papers	adam.striegel@bayer.com
Nicholas Steppig, Grad Student Posters	nicholas.steppig@basf.com
Joe Ikley, Undergrad Posters	joseph.ikley@ndsu.edu

Extension, Student Video Contest

Marcelo Zimmer, Chair	zimmer6@purdue.edu
Meaghan Anderson, Vice Chair	mjanders@iastate.edu

NCWSS Recognitions

Row Crop Herbicides

Vipin Kumar, Chair
Ryan Bryant-Schlobohm, Vice-chair

vkumar4@huskers.unl.edu
ryan.bryant-schlobohm@upl-ltd.com

Cover Crops & IWM

Devin Hammer, Chair
Sachin Dhanda, Vice-chair

devin.hammer@bayer.com
dhand019@umn.edu

Herbicide Application Technologies

Angela Kazmierczak, Chair
Ryan Edwards, Vice-chair

angela.kazmierczak@bayer.com
RJEdwards@landolakes.com

Weed Genetics & Herbicide Physiology

Isabel Werle Noe, Chair
Jesse Haarmann, Vice-chair

isabels6@illinois.edu
jesse.haarmann@syngenta.com

Weed Biology & Ecology

Mandeep Singh, Chair
Eugene Law, Vice-Chair

msingh9@huskers.unl.edu
Law.262@osu.edu

Horticulture & Specialty Crops

Reid Smeda, Chair
Rohith Vulchi, Vice-chair

smedar@missouri.edu
rohith.vulchi@fmc.com

Range, Pasture & Vegetation Management

Mark Renz, Chair
Joe Omielan, Vice-Chair

mrenz@wisc.edu
joe.omielan@uky.edu

NCWSS Standing Committees

Strategic Planning

Angela Kazmierczak (Chair)
Alexis Meadows (IA)
Kip Jacobs (IL)
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Travis Legleiter (KY)
Ben Westrich (CO/WY)
Tate Castillo (KS)
Angela Kazmierczak (ND)
Milos Zaric (NE)
Eric Jones (SD)

angela.kazmierczak@bayer.com
alexis.meadows@corteva.com
Kkp.Jacobs@upl-ltd.com
stah0012@umn.edu
chad.smith@valent.com
dewerff@wisc.edu
slmeyers@purdue.edu
dan.wilkinson@syngenta.com
dain.bruns@syngenta.com
christopher.budd@basf.com
travis.legleiter@uky.edu
ben.westrich@syngenta.com
tate.castillo@bayer.com
angela.kazmierczak@bayer.com
mzaric2@unl.edu
Eric.Jones@sdstate.edu

Distinguished Achievement Award

Dawn Refsell, Chair
Mark Bernards, Vice-chair
Reid Smeda, Past-chair

dawn.refsell@corteva.com
mbernards@riw2000.com
smedar@missouri.edu

Fellow Committee

Mark Peterson, Chair
Christy Sprague, Vice-chair

sdpete58@hotmail.com
sprague1@msu.edu

Finance Steering & Policy Committee

Eric Spandl, Chair
Amit Jhala, Vice-chair

epsandl@landolakes.com
amit.jhala@unl.edu

NCWSS Recognitions

Future Site Selection Committee

Mark Loux, Chair

Dawn Refsell, Vice-chair

loux.1@osu.edu

dawn.refsell@corteva.com

Invasive Plants Committee

Tate Castillo, Chair

Mark Renz, Vice-chair

tate.castillo@bayer.com

mrenz@wisc.edu

Resolutions & Necrology Committee

Zach Rystrom, Chair

Chad Lammers, Vice-chair

zach@midwestresearchinc.com

chad@midwestresearchinc.com

Local Arrangements

Christy Sprague, Chair

Erin Burns, Chair

Dan Wilkinson

Ryan Bounds

Erin Hill

Karen Renner

Eric Patterson

Brian Stiles

Janis Michael

Kaitlin Waibel

John Pawlak

Josh Miranda

sprague1@msu.edu

burnser5@msu.edu

dan.wilkinson@syngenta.com

ryan.bounds@syngenta.com

hiller12@msu.edu

renner@msu.edu

patte543@msu.edu

stilesbr@msu.edu

michael42@msu.edu

Kaitlin.waibel@basf.com

John.pawlak92@gmail.com

Nominating Committee

Nathan Haugrud, Chair

Ramawater Yadav, Vice-chair

Amit Jhala

Ryan Henry

David Johnson

Reid Smeda

nathan.haugrud@syngenta.com

yadav.206@osu.edu

amit.jhala@unl.edu

ryan.henry@upl-ltd.com

david.h.johnson@corteva.com

smedar@missouri.edu

NCWSS Recognitions

Honorary Members/Fellows

1948	L.W. Dephart *	1983	Ronald E. Doersch *
1949	A.H. Larson *	1984	Edward W. Stroube *
1950	J.W. Zahnley *		Oliver E. Strand *
1951	R.W. Fuelleman *		Gail A. Wicks *
	Ted F. Yost *	1985	Robert Hiltibran *
1952	Henry E. Wood *	1986	Elroy J. Peters *
1953	George Briggs *		Deane W. Finnerty *
	Walter C. Dutton *		Oliver G. Russ *
1954	A.L. Bakke *	1987	Ralph Althaus *
1955	Charles J. Willard *		William M. Phillips *
1956	R.S. Dunham *		Gerald R. Miller
1957	P.J. Olson *	1988	Robert Benson
1958	L.W. Melander *		Calvin Messersmith
	T.K. Pavlychenko *		Edward Stoller
1959	E.A. Helgeson *	1989	Loyd M. Wax
1960	Oliver C. Lee *		Alan R. Putman
1962	Sig Bjerken *	1990	Alan G. Dexter
1964	K.P. Buchholtz *		Russell L. Nash *
	E.P. Sylwester *	1991	George Kapusta *
1966	Robert C. Beatty *		Marshall McGlamery *
	Clare Buskirk *		Russell Moomaw *
1967	J.K. Freeman *		Don Penner
1968	E.K. Alban *	1992	R. Gordon Harvey, Jr. *
	H.A. Friesen *		Larry K. Binning
1969	Lawrence Southwick *		Alex R. Martin
	David W. Staniforth *		Don Taylor
1970	Delbert D. Hemphill *	1993	Merrill A. Ross, Jr. *
	George Frederick Warren *		Robert G. Wilson
1971	Fred W. Slife *		Jerry D. Doll
1972	Thomas Victor Beck *	1994	Ted R. Warfield
	O. Hale Fletchall *		William W. Witt
1973	Richard Behrens*	1995	Charles R. Fenster
	Lawrence H. Hannah *		Leon J. Wrage
1974	William Lobay *	1996	Thomas T. Bauman *
1975	John D. Furrer *		Earl W. Chamberlain
1976	Lyle A. Derscheid *		Richard S. Fawcett
	LeRoy G. Holm *		William E. Lueschen
1977	James W. Divall	1997	Stephen D. Miller *
	James L. Williams, Jr. *		M.D.K. Owen
1978	Melwin K. McCarty *		Fred W. Roeth
	Robert E. Nylund*	1998	Paul J. Ogg *
1979	Ellery L. Knake *		James P. Worthington *
	Kenneth W. Bradfield *	1999	Michael Barrett
1980	John D. Nalewaja *		Norman J. Probst
	O.C. Burnside *	2000	Douglas D. Buhler
1981	Rodney J. Fink *		Bill Miller
	Juett C. Hogancamp *		Philip L. Orwick
	Larry W. Mitich *		Stephen C. Weller
1982	W.D. Carpenter *	2001	LeRoy R. Cobia
	James W. Herron *	2002	James J. Kells
	William F. Meggitt *	2003	Karen Ann Renner
1983	Robert N. Andersen*		Charles Slack
	Dale E. Bush*		Phillip Stahlman

NCWSS Recognitions

Honorary Members/Fellows (continued)

2004	Duane Rathman David Regehr	2014	Adrian Moses David Stoltenberg
2005	Dallas E. Peterson	2015	Dave Johnson Mark Wrucke
2006	James R. Martin Bernard H. Zandstra	2016	David Simpson Curtis Thompson
2007	Chris M. Boerboom Michael J. Horak	2017	John Hinz Patrick J. Tranel
2008	Thomas J. Peters Jeffrey Gunsolus Kassim Al-Khatib	2018	Anita Dille Mark Peterson
2009	J.D. Green Thomas B. Threewitt * Robert N. Klein *	2019	Greg Dahl Mark Loux Rich Zollinger
2010	No nominations	2020	Kevin Bradley Dawn Refsell Christy Sprague
2011	Bill Johnson Harlene Hatterman-Valenti Gordon K. Roskamp	2021	Aaron Hager Eric Spandl
2012	Peter H. Sikkema Bob Hartzler	2022	Stott Howard Stevan Knezevic
2013	Bryan Young Roger Becker	2023	Greg Elmore Bill Simmons
		2024	Fritz Koppatschek

* Deceased

¹Society members being honored were originally referred to as Honorary Members. Beginning in 1995, the award was changed to Fellow.

NCWSS Recognitions

North Central Weed Science Society Presidents

1944	No President	1986	Wax, Loyd M.
1945	Yost, Ted F. *	1987	Chamberlain, Earl *
1946	Yost, Ted F. *	1988	Harvey, R. Gordon *
1947	Hanson, Noel S. *	1989	Worthington, James P. *
1948	Willard, Charles J. *	1990	Martin, Alex R.
1949	Dunham, R. S. *	1991	Taylor, T. Don
1950	Worzella, W. W. *	1992	Stoller, Edward W.
1951	Sylwester, Erhardt P. *	1993	Warfield, Ted R.
1952	Buchholtz, Kenneth P. *	1994	Bauman, Thomas T. *
1953	Gilbert, C. J. *	1995	Cobia, LeRoy R.
1954	Lee, Oliver C. *	1996	Dexter, Alan G.
1955	Grigsby, Buford H. *	1997	Miller, Bill
1956	Helgeson, Earl A. *	1998	Buhler, Douglas D.
1957	Slife, Fred W. *	1999	Orwick, Philip L.
1958	Derscheid, Lyle A. *	2000	Kells, James J.
1959	Foster, J. Roe *	2001	Rathmann, Duane P.
1960	Holm, Leroy G. *	2002	Peterson, Dallas E.
1961	Alban, E. K. *	2003	Horak, Michael J.
1962	Bjerken Sig. *	2004	Doll, Jerry D.
1963	Hemphill, Delbert D. *	2005	Peters, Tom
1964	Hemphill, Delbert D. *	2006	Miller, Stephen D. *
1965	Furrer, John D. *	2007	Moses, Adrian
1966	Furrer, John D. *	2008	Johnson, William G.
1967	Warden, Robert L. *	2009	Holm, Mick
1968	Fletchall, O. Hale *	2010	Boerboom, Chris
1969	Beck, Thomas V. *	2011	Wrucke, Mark
1970	Hannah, Lawrence H. *	2012	Young, Bryan
1971	Knake, Ellery *	2013	Johnson, Dave
1972	Williams, Jr., James L. *	2014	Green, J.D.
1973	Meggitt, William *	2015	Hinz, John
1974	Bradfield, Kenneth W. *	2016	Dille, Anita
1975	Burnside, Orvin C. *	2017	Dahl, Gregory
1976	Fink, Rodney J. *	2018	Sprague, Christy L.
1977	Carpenter, Will D. *	2019	Hager, Aaron G.
1978	Doersch, Ronald E. *	2020	Howard, Stott
1979	Nalewaja, John D. *	2021	Hatterman-Valenti, Harlene
1980	Stroube, Edward W. *	2022	Simpson, David M.
1981	Herron, James W. *	2023	Smeda, Reid
1982	Benson, Robert L.	2024	Refsell, Dawn
1983	DiVall, James W.	2025	Bernards, Mark
1984	Miller, Gerald R.		* Deceased
1985	Messersmith, Calvin G.		

NCWSS Recognitions

Distinguished Achievement Awards

- 1990 Gerald W. Gogan – Education
Gail A. Wicks - Service
Robert G. Wilson - Research
Jeffrey L. Gunsolus - Young Scientist
- 1991 F. Strizke - Education
Paul G. Mayland - Industry
Patrick J. Shea - Research
- 1992 William W. Witt - Education
James P. Worthington - Education
Rex A. Liebl - Research
Jerry D. Doll - Service
- 1993 Robert G. Hartzler - Education
Douglas D. Buhler - Research
Karen A. Renner - Young Scientist
- 1994 David L. Regehr - Education
Deane W. Finnerty - Industry
Robert N. Andersen - Service
David A. Mortensen - Young Scientist
- 1995 Will D. Carpenter - Industry
Phillip W. Stahlman - Research
M.D.K. Owen - Service
- 1996 Beverly R. Durgan - Education
Charles L. Kern - Industry
E. James Retzinger - Industry
Michael J. Horak - Young Scientist
- 1997 Roger Becker - Education
Joseph G. Vollmer - Industry
Charles H. Slack - Research
Richard Zollinger - Service
David E. Stoltenberg - Young Scientist
- 1998 Randy W. Lloyd - Industry
Ronald F. Krausz - Research
James R. Martin - Service
- 1999 Thomas R. Hoverstad - Professional Staff
Robert J. Kremer - Research
J. D. Green - Service
Chris M. Boerboom - Young Scientist
Reid J. Smeda - Young Scientist
- 2000 Harlan P. Palm - Industry
James F. Lux - Professional Staff
Gary E. Powell - Professional Staff
David A. Vox - Professional Staff
William G. Johnson - Young Scientist
- 2001 John B. Masiunas - Education
Bernard H. Zandstra - Education
Patrick W. Geier - Professional Staff
Douglas J. Maxwell - Professional Staff
Kassim Al-Khatib - Research
- 2002 Paul L. Sprankle - Industry
Thomas B. Threewitt - Industry
Monica Elmes - Professional Staff
John L. Luecke - Professional Staff
Bryan Young - Young Scientist
- 2003 Mark Loux - Education
Kenneth Carlson - Industry
Daniel E. Schroeder - Industry

NCWSS Recognitions

2003	Andrew Chomas - Professional Staff Jeffrey Stachler - Professional Staff
2004	Gordon Roskamp - Education Robert N. Klein - Education David Stoltenberg - Research Robert E. Wolf - Service Patrick J. Tranel - Young Scientist
2005	Chris Boerboom - Education Dennis Belcher - Industry Anthony F. Dobbels - Professional Staff Curtis R. Thompson - Service Christy Sprague - Young Scientist
2006	Richard K. Zollinger - Education John R. Hinz - Industry Christy Shropshire - Professional Staff Glenn Nice - Service Dean E. Riechers - Young Scientist
2007	Douglas Doohan - Education Kevin Gibson - Young Scientist Martin M. Williams II - Young Scientist
2008	Frank Forcella - Research Anita Dille - Young Scientist Damian Franzenburg - Professional Staff Joseph Matthews - Professional Staff
2009	Kevin W. Bradley – Young Scientist Adam S. Davis – Young Scientist Reid J. Smeda – Education Adrian J. Moses – Industry James L. Moody – Professional Staff
2010	Darren Robinson – Young Scientist Aaron Hager – Education Jon Scott – Professional Staff Peter Sikkema - Research
2011	Anita Dille - Education Walter Fick - Education Terry Wright - Industry Greg Dahl - Industry Nader Soltani - Professional Staff Chad Brabham - Graduate Student
2012	Dain Bruns - Industry Fritz Breitenbach - Professional Staff Timothy Trower - Professional Staff Erin Taylor-Hill - Professional Staff Paul Marquardt-Graduate Student
2013	Kirk Howatt – Education Mark Renz – Education Patrick Tranel – Research Stevan Knezevic – Research Christy Sprague - Service Rodrigo Werle – Graduate Student
2014	Greg Kruger – Young Scientist Ryan Lins – Young Scientist Dawn Refsell – Industry Jeff Golus – Professional Staff Collin Auwarter – Professional Staff Jessica Bugg – Graduate Student
2015	Brian Jenks – Service

NCWSS Recognitions

2015	Doug Nord – Service Marvin Schultz – Industry Bruce Ackley – Professional Staff Darren Robinson – Research Cody F. Creech – Graduate Student
2016	Richard Cole- Industry Mark Peterson- Industry Larry Hageman- Industry Stott Howard- Service Amit Jhala- Young Scientist
2017	Scott Cully – Industry Helen Flanigan – Industry Lowell Sandell – Industry Steven Knezevic – Education Julie Young – Professional Staff Parminder Chahal – Graduate Student
2018	Carla Yerkes – Industry Kevin Bradley – Education Peter Sikkema – Education Richard Proost – Professional Staff Phil Westra – Research Marshall Hay – Graduate Student
2019	Mark Bernards – Education David Thomas – Industry Nader Soltani – Research Mithila Jugulam – Research Mayank Malik – Young Scientist Ethann Barnes – Graduate Student
2020	Eric Spandl – Industry Mandy Bish – Research Joe Wuerffel – Young Scientist Vipan Kumar – Young Scientist Lisa Behnken – Professional Staff Ram Yadav – Graduate Student
2021	Kevin Thorsness – Industry Michael Weber – Industry Rodrigo Werle – Young Scientists Ryan Edwards – Young Scientists Andrew Toft – Professional Staff
2022	David Nicolai – Education Nathan Haugrud – Graduate Student
2023	Meaghan Anderson – Education Steve Meyers - Young Scientist Dean Riechers - Research Alexa Lystad - Professional Staff Mandeep Singh – Graduate Student
2024	Bruce Ackley – Education Mayank Malik – Industry Ryan DeWerff – Professional Staff

NCWSS Recognitions



NCWSS Awards Program

Master of Ceremonies.....	Dawn Refsell
Student Travel Awards.....	Dawn Refsell
Distinguished Achievement Awards.....	Dawn Refsell
Fellows.....	Mark Petersen
Presentation of New Officers.....	Mark Bernards

STUDENT TRAVEL AWARDS

These are awarded to qualifying graduate students for their first attendance at the NCWSS annual meeting. This travel grant program is intended to encourage graduate student involvement in the NCWSS annual meeting while students are in the early portion of their graduate program.

Alice Lazzari, University of Wisconsin-Madison
Miriam Styer, The Ohio State University

DISTINGUISHED ACHIEVEMENT AWARDS

OUTSTANDING GRADUATE STUDENTS

This award recognizes outstanding NCWSS graduate student members. The student must be actively involved in the Society, as well as a contributor to the field of weed science through extension, research, teaching, and service. This student has gone beyond the traditional responsibilities of a graduate student. Examples of outstanding contributions include serving as a mentor, novel research methodology, new teaching techniques, organizing professional development workshops, or conducting outreach events.

NCWSS Recognitions

Jeanine Auxiliador Arana Cordonero, Purdue University



Jeanine Arana is a Ph.D. candidate in the Department of Horticulture and Landscape Architecture (HLA) at Purdue University, advised by Dr. Stephen Meyers. Originally from Managua, Nicaragua, she discovered her passion for agricultural sciences while studying at Zamorano University in Honduras. After joining Purdue as a Visiting Scholar in 2019, she completed her M.S. in 2022, researching weed management in

cucurbit crops, and immediately began her doctoral work. Her Ph.D. research focuses on improving multi-year strawberry production on plastic mulch, specifically investigating weed control strategies and varietal performance.

Jeanine has made significant contributions to the scientific community, authoring and co-authoring multiple peer-reviewed research articles in journals such as *Weed Science* and *Weed Technology*. Her excellence in sharing these findings through oral, poster, and video presentations has been recognized with multiple awards from the North Central Weed Science Society (NCWSS) and the Weed Science Society of America (WSSA), as well as Outstanding Graduate Student Research Awards from the HLA department. She is also deeply committed to Extension; she frequently connects with growers through field days and newsletters, a dedication that earned her the Purdue Cooperative Extension Specialists Association (PUCESA) Student in Extension Award.

Beyond her academic work, Jeanine is an active leader and mentor. She has served as president and vice president of the HLA Graduate Student Organization and plays a key role in the Association of Zamorano Alumni, recruiting and mentoring visiting scholars from Latin America. Her efforts to foster inclusivity were recognized with the Diversity Action Team in Agriculture Unsung Diversity Hero Award. In her free time, she enjoys watching scary movies and spending time with friends.

NCWSS Recognitions

Isabel Werle Noe, University of Illinois

Isabel Werle Noe grew up in a rural town in southern Brazil. She earned her B.S. in Agronomy from the Federal University of Santa Maria in 2019 and completed her M.S. in Crop, Soil, and Environmental Sciences at the University of Arkansas in 2022 under the guidance of Dr. Nilda Roma-Burgos. Isabel is currently a Ph.D. Candidate in the Department of Crop Sciences at the University of Illinois at Urbana-



Champaign under the guidance of Dr. Patrick Tranel. Her dissertation research focuses on understanding non-target-site resistance mechanisms in waterhemp (*Amaranthus tuberculatus*) using genetic mapping, inheritance studies, and 'omics' approaches. She is also investigating herbicide physiology and the role of environmental conditions in herbicide performance.

Isabel appreciates the opportunity she had to serve as Vice Chair of the NCWSS Graduate Student Organization in 2022 and as President and Vice President of the WSSA Graduate Student Organization from 2022 to 2024. She also served as a student representative on the WSSA Public Awareness Committee and as Vice Chair of the Weed Genetics & Herbicide Physiology section at the NCWSS meeting in 2024. During her graduate studies, Isabel has contributed to education in weed science as a teaching assistant for three courses in plant protection and weed science. Since 2023, she has also helped coach the University of Illinois Weed Team, earning eight team or individual awards at the NCWSS and National Weed Science Contests.

Isabel is a recipient of the Slife and Ainsworth Fellowships from the Department of Crop Sciences at the University of Illinois. She has authored or co-authored 19 peer-reviewed publications and 49 conference abstracts. Her research has been recognized with first-place poster and paper awards at both NCWSS and WSSA meetings. She looks forward to continuing her contributions to the field of weed science in the future.

NCWSS Recognitions

PROFESSIONAL STAFF

This award recognizes outstanding and sustained contributions in support of weed science activities in the North Central region. Nominees will be restricted to individuals that work under the direction of university, federal, or industry scientists. These individuals may have titles such as researcher, research associate, technician, support scientist, or specialist. The nominee must have been involved in weed science research, extension, or resident education for at least five years at the time of nomination.

Daniel Smith, University of Wisconsin-Madison

Dan Smith is the program manager for the Nutrient and Pest Management Program at the University of Wisconsin-Madison Division of Extension. He grew up in Walnut, IL and spent much of his free time visiting his grandparents' farm and knew from a young age he would work in agriculture. Daniel received a B.S. degree in Soil and Crop Science and Agribusiness from UW-Platteville in 2012. Following graduation, he worked full time for a company he started, Smith Lawn and Garden Service, providing a variety of landscape services including turf weed control and fertilization programs. This business was acquired in 2016 by the largest regional competitor. Daniel completed his M.S. degree in Agroecology (weed science emphasis) from University of Wisconsin-Madison in 2016 under Dr. Vince Davis.



Daniel worked as the Southwest Regional Agronomist for the Nutrient and Pest Management Program at the University of Wisconsin from 2016-2024. In 2024 Daniel became program manager of this program. He has been responsible for coordinating and collaborating on weed science research and outreach efforts at the Lancaster Agricultural Research Station since 2018. This work has included waterhemp management plots and a systems-based approach to weed management featuring cereal rye cover crop and no-till practices. He has led multiple combine cleaning clinics and several outreach videos on cleaning a combine for weed seeds. Daniel has collaborated

NCWSS Recognitions

with faculty and researchers on numerous outreach articles, videos, and presentations. To help better tell the story, he has captured thousands of photos and hours of video content showcasing many aspects of nutrient and pest management practices. Since 2024, he has served on the organizing committee for the University of Wisconsin Weed Science workshop. Daniel is a Certified Crop Advisor and is the University of Wisconsin representative to the Wisconsin Certified Crop Advisor Board.

Daniel has been an active member of the North Central Weed Science Society since 2013. He has presented multiple papers and posters, served as a student contest judge every year since 2016, and volunteered at several summer weed contests. He has served as the Wisconsin representative to the Strategic Planning committee and as a central region director. In his free time, Daniel volunteers as a member of the University of Wisconsin-Platteville Foundation and Alumni Association Board. He lives on his wife's family farm near Mazomanie, WI and they enjoy golfing, cooking, traveling, and gardening. Daniel is a woodworker and enjoys spending time back home in IL helping his parents and grandparents.

INDUSTRY

This award is to be given to industry representatives who meet the basic guidelines in education, research, or service categories. In addition, it is important to include the contributions this individual has made to weed science within the industry.

Ryan Edwards, WinField United

Ryan J. Edwards, Ph.D. is a Senior Research Manager specializing in Crop Protection Products (CPP) and Adjuvants at WinField United, the agribusiness division of Land O'Lakes, based in River Falls, WI. With over 15 years of experience in academic research and industry product development, Dr. Edwards is recognized for his deep expertise in weed science and crop



NCWSS Recognitions

protection R&D. He leads a multidisciplinary research program focused on developing innovative crop protection and adjuvant solutions, overseeing more than 200 internal and 100 external field trials annually. Since 2015, Dr. Edwards has launched over 30 new products, authored peer-reviewed publications, and delivered more than 40 conference presentations. He is an active leader in major weed science societies, recipient of the NCWSS Young Scientist Award, and a mentor to emerging scientists in the field.

EDUCATION

This award recognizes outstanding educational achievements in weed science. Individuals making outstanding contributions in areas such as resident, extension, industrial, and regulatory education are eligible. Principal criteria include innovative or unique approaches that result in learning, ability to clearly communicate ideas, motivation of the intended audience, and recognition of accomplishments by peers and the intended audience.

Lizbeth Stahl, University of Minnesota



Liz Stahl is an Extension Professor and Extension Educator in Crops in southwestern Minnesota. She earned her M.S. in Agronomy/Weed Science and B.S. in Agricultural Education with a minor in Agricultural Economics from the University of MN. Prior to joining Extension in 2004, she worked as a research agronomist with

Golden Harvest, with a non-profit on third crops, and as a crop production specialist and Agri-Source support person with Cenex/Land O'Lakes. Part of her efforts as a research agronomist was studying corn and soybean variety interactions with herbicides and delivering this information to farmers.

Liz has been a cornerstone of Private and Commercial Pesticide Applicator recertification in SW Minnesota since 2004, developing and delivering educational materials for use

NCWSS Recognitions

statewide that focuses on integrated weed management, applicator safety, and herbicide resistance. Liz leads the Integrated Pest Management Assessment, a statewide survey of applicators that helps guide research and educational priorities. She also leads the Strategic Farming online webinar program that serves as a premier outlet of research-based information for the UMN Crops Team. A special interest is herbicide and weed management interactions with cover crops - Liz has helped develop and implement numerous research projects, fact sheets, and online and in-person content around this topic. She has received national recognition for her educational programming efforts from the National Association of County Ag Agents, the American Society of Agronomy, and the American Association of Pesticide Safety Educators.

Since becoming a member of the NCWSS in 1992, Liz has served in various roles including currently as a member of the Strategic Planning Committee and Vice-Chair of the Women in Weed Science. She was also Chair of the Extension Committee and a State Director. Liz loves to travel with her family, having her husband stop many times to take weedy field pictures, and has two wonderful daughters, Jordan and Alyx.

Sarah Lancaster, Kansas State University

Dr. Sarah Lancaster was raised on an integrated crop and livestock farm near Jonesburg, MO. She holds a Bachelor of Science in Plant Sciences, cum laude, from the University of Missouri–Columbia (2002), a Master of Science in Crop Science from North Carolina State University (2004), and Ph.D. in Agronomy from Texas A&M University (2008). Dr. Lancaster currently serves as



Assistant Professor and Extension Specialist in the Department of Agronomy at Kansas State University, where she leads statewide programs focused on integrated weed management and herbicide resistance mitigation in major cropping systems, including corn, cotton, grain sorghum, soybean, and wheat. Before joining Kansas State University in 2019, Dr. Lancaster held faculty positions at Missouri State University and Oklahoma State University, where she instructed thousands of

NCWSS Recognitions

students in both introductory and advanced courses in general agronomy, weed management, and soil science. She has mentored graduate students and undergraduate researchers, guiding projects on herbicide resistance, cover crop systems, and precision weed management.

At Kansas State University, Dr. Lancaster's extension program addresses weed management challenges, including herbicide resistance and regulatory changes. She develops and delivers programs that help producers, crop consultants, and agribusiness professionals manage weeds using a variety of tactics, including precision application technologies and non-chemical control strategies. Her outreach efforts include statewide training for Kansas pesticide applicators, educational programs focused on weed management in corn, cotton, soybean, grain sorghum, and wheat, and hands-on summer field schools and plot tours. She is a regular contributor to the K-State Agronomy eUpdate, popular press articles, and multiple extension bulletins, including the lead author of the Kansas Chemical Weed Control Guide. Dr. Lancaster contributes to various webinars and other digital media products and co-hosts the "War Against Weeds" podcast.

Dr. Lancaster maintains an applied research program that complements her extension efforts focused on integrated weed management strategies. She has secured competitive funding from organizations such as USDA-NIFA, United Soybean Board, Cotton Incorporated, and Kansas commodity commissions, supporting projects on topics ranging from layered residual herbicide programs and targeted herbicide applications to cover crop impacts on weed suppression and directed energy for weed control. Dr. Lancaster has authored or co-authored peer-reviewed publications in *Weed Science*, *Weed Technology*, *Agronomy Journal*, and *PNAS Nexus*.

Dr. Lancaster is an active leader in professional societies, including the Weed Science Society of America and the North Central Weed Science Society. She has chaired national committees and contributed to initiatives advancing herbicide stewardship and endangered species compliance. Her contributions have been recognized through numerous honors, including the Gamma Sigma Delta Excellence in Extension Award (2025), WSSA President's Award (2023), and multiple teaching and advising awards from Oklahoma State University.

NCWSS Recognitions

YOUNG SCIENTIST

This award is to be given to members who fulfill the requirements to qualify in the above education, research, and service award categories and who must have received a terminal degree no more than 10 years before receiving the award at the annual meeting.

Erin Burns, Michigan State University

Dr. Erin Burns is an Assistant Professor and Weed Science Extension Specialist in the Department of Plant, Soil and Microbial Sciences at Michigan State University. Since joining MSU, she has led a research and extension program dedicated to addressing current and emerging weed management challenges across Michigan's diverse cropping systems. Erin is a native of the Upper Midwest and earned her Ph.D. from Montana State University, M.S. from North Dakota State University, and B.A. from the College of Saint Benedict, MN.



Erin's research integrates weed biology, ecology, and applied field studies. She is particularly focused on identifying management practices that slow resistance evolution and evaluating how climate variability will influence weed population dynamics. Through her extension appointment, she collaborates directly with agricultural stakeholders to translate research findings into practical tools and recommendations.

Erin has been an active member of the NCWSS since 2017 and has contributed to the society in a variety of roles. Her service has included participation on the Resident Education, Strategic Planning, and Local Arrangements Committees. She has also served multiple times as a paper or poster judge and currently represents NCWSS as a liaison to the WSSA.

NCWSS Recognitions

FELLOW AWARD

Fellow is the highest honor that the Society can confer on to an individual member. Only individuals who have made outstanding contributions in two or more of the following areas: 1) Service to NCWSS, 2) Presentations and publications in the NCWSS, 3) Service to other Weed Science societies, 4) Academic, Industry, Government, or other meritorious Weed Science service. No more than 0.5% of the membership can receive the award each year. Fellows are considered life-time members of the NCWSS.

Reid J. Smeda, University of Missouri



Dr. Reid Smeda is a Professor in the Division of Plant Sciences at the University of Missouri. His responsibilities include teaching weed science courses for undergraduates and graduate students.

Currently, he is also co-instructing a vegetable production course. His research program encompasses a) biology and management of problem weed species in agronomic and horticultural crops; b) physiology and mechanism(s) for weed species resistant to herbicides; and c) control of invasive species in non-crop and industrial vegetation management habitats.

Dr. Smeda has an active graduate education program, having trained over 41 M.S. and Ph.D. students. This has resulted in over 75 peer-reviewed publications as well as 10 book chapters.

He has served the NCWSS in many capacities including: President and associated roles, Chair of Resident Education, NCWSS representative to the WSSA, CAST representative, organized 2 symposia, and served numerous times as a Section Chair and poster/paper judge.

NCWSS Recognitions

North Central Weed Science Contest Locations

YEAR	Company	Location
1981	Agri-Growth	Hollandale, MN
1982	Agri-Growth	Hollandale, MN
1983	Lilly Research Lab	Leshara, NE
1984	Dow Chemical Research	Geneseo, IL
1985	Bayer (Mobay)	Stilwell, KS
1986	Union Carbide	Newton, IA
1987	Monsanto	Monmouth, IL
1988	Agri-Growth	Hollandale, MN
1989	FMC	Champaign, IL
1990	DowElanco	Greenfield, IN
1991	CibaGeigy	Champaign, IL
1992	Cenex Land O'Lakes	Iowa
1993	Zeneca	Champaign, IL
1994	Bayer (Miles)	Stilwell, KS
1995	Amcy	Seymour, IL
1996	Monsanto	Monmouth, IL
1997	Land O'Lakes	Webster City, IA
1998	Valent	Champaign, IL
1999	Agri-Growth	Hollandale, MN
2000	Bayer	West Lafayette, IN
2001	Monsanto	Monmouth, IL
2002	Dow AgroSciences	Fowler, IN
2003	Syngenta	Champaign, IL
2004	University of Minnesota- Southern Research & Outreach Ctr.	Waseca, MN
2005	Kansas State University	Manhattan, KS
2006	Midwest Research Inc.	York, NE
2007	Bennett Ag. Research Corp	Richland, IA
2008	SGS Alvey Ag Research	Carlyle, IL
2009	Joint NC/NE – ABG Ag Services	Indianapolis, IN
2010	no contest	
2011	National Contest, University of Tennessee	Knoxville, TN
2012	Diamond Ag Research Inc.	Larned, KS
2013	joint NC/NE - Monsanto	Monmouth, IL
2014	DuPont Pioneer	Johnston, IA
2015	National Contest, The Ohio State University	Columbus, OH
2016	Purdue University	West Lafayette, IN
2017	Iowa State University FEEL	Ames, IA
2018	Monsanto Water Utilization Learning Center	Gothenburg, NE
2019	National Contest BASF, Bayer, Corteva, Valent Klein Family Farm	Seymour, IL
2020	no contest	
2021	North Dakota State University	Fargo, ND
2022	Corteva Agriscience	Johnston, IA
2023	Bayer	Union City, TN
2024	ABG Ag Services	Sheridan, IN
2025	BASF, Bayer, Corteva, Valent	Seymour, IL

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NCWSS Notes

Time Schedule

Mark papers and meetings in the space below.

Time	Tuesday	Wednesday	Thursday
8:00	Poster Session 1	Poster Session 2	Society Breakfast, Student Contest Awards & What's New in Industry
8:15			
8:30			
8:45			
9:00			
9:15			
9:30			
9:45			
10:00	General Session		
10:15			
10:30			
10:45			
11:00			
11:15			
11:30			
11:45			
12:00	Student Luncheon	NCWSS Awards Luncheon	
12:15			
12:30			
12:45			
1:00			
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3:15			
3:30			
3:45			
4:00			
4:15			
4:30			
4:45			
5:00			
5:15			
5:30		Society Social	
5:45			
6:00			
6:30			

Future NCWSS Annual Meeting Sites

2026 - December 7 – 10 w/NEWSS Columbus, OH

2027 - December 6 - 9 Des Moines, IA

Meeting Map